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ABSTRACT

The second volume of the introduction to psychology and leadership course (see the final reports which summarize the development projects, EM 010 418, EM 010 419, and EM 010 484) concentrates on the psychology of individual behavior and is divided into three separate documents. Like Volume One (EM 010 420), it is also a self-instructional, syndactic test with discussion sections and criterion quizzes. EM 010 421 and EM 010 423 are the first and third parts of this volume, and EM 010 424 through EM 010 447 and EM 010 451 through EM 010 512 are related documents. (SH)

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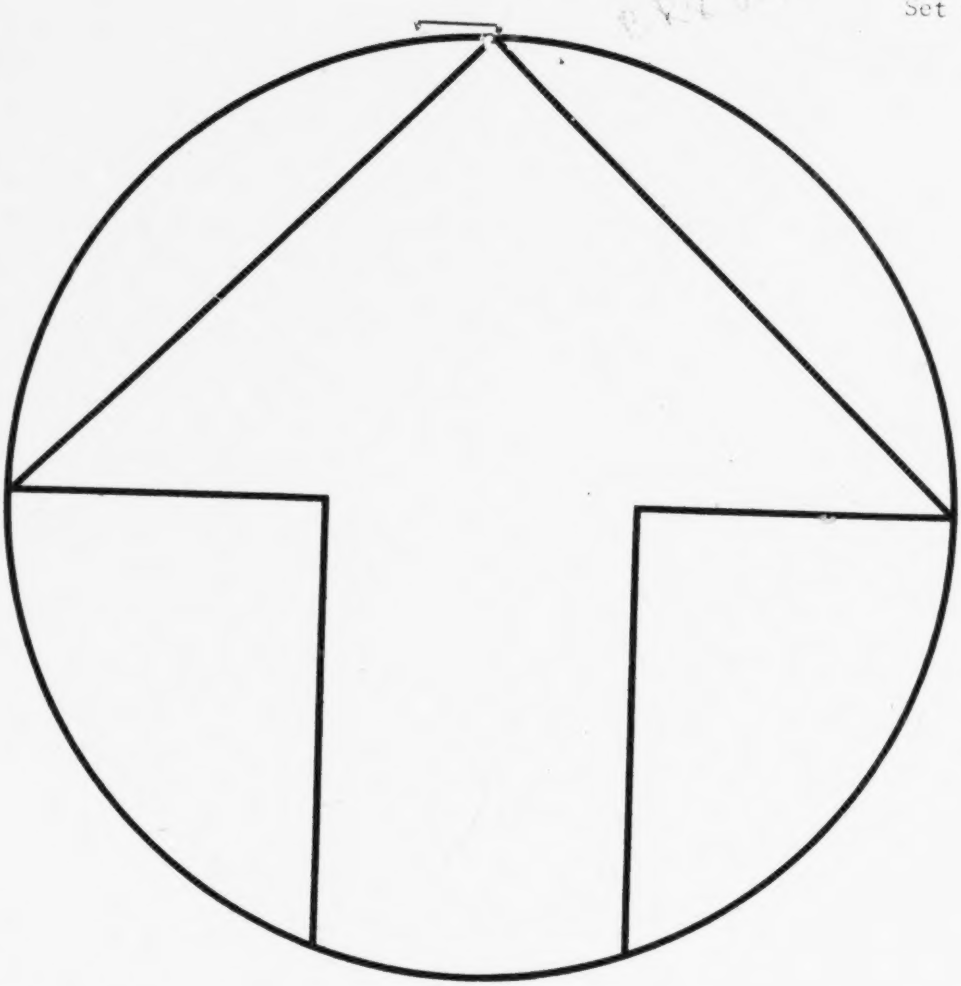

Introduction To Psychology And Leadership

Volume II-B

Individual Behavior

EM 010 422

ED 071280

United States Naval Academy

INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PART TWO

INDIVIDUAL BEHAVIOR

Segments I, II, III, IV, & V

Volume II-B

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1971

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United States Naval Academy

INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PART TWO
INDIVIDUAL BEHAVIOR

Segment I
Introduction to Psychology

Syndactic Text
Single Volume
(ST/SV)

WESTINGHOUSE LEARNING CORPORATION
Annapolis, Maryland
1971

FOREWORD

> *"Know then thyself, presume*
> *not God to scan;*
> *The proper study of mankind*
> *is man."*
>
> *Alexander Pope*

The essence of psychology is understanding, and nowhere is understanding so vital an ingredient as in leadership. While schools of psychological thought may wage war on each other's methods and principles, there is the common effort by everyone, however connected with the field, to attain some handle on the enormously complex workings of human feeling and action.

This section on psychology addresses those areas that are most appropriate for the psychological awareness leaders need to motivate and train men. It is hoped that given this sketch, the student will, on his own, explore deeper into the fine body of readings in this field.

The first segment traces some of the history of this relatively new science, differentiates between significant schools of psychological thought, and points out how misconceptions about the workings of the mind are as prevalent in our own day as they were in past history.

INTRODUCTION TO PSYCHOLOGY

Summary 1

The Historical Development of Psychology

The field of psychology began with the caveman's first drawings. Unable to understand natural events, primitives based their explanation of behavior on superstitious beliefs. The popular notion was that spirits or demons invaded the body and were responsible for man's actions. Consequently, all occurrences were considered the work of spirits, good or evil.

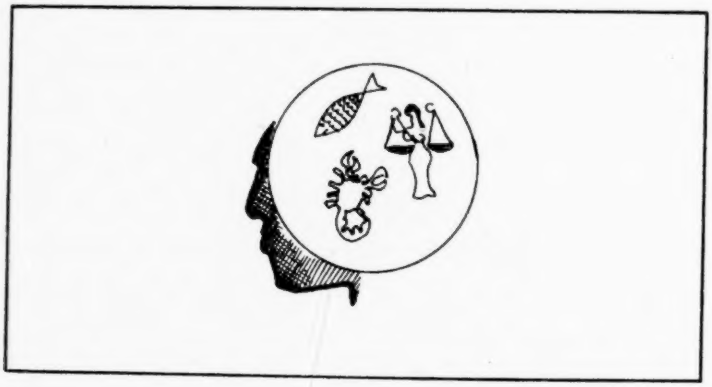

Figure 1. Superstition: "Guided by the Stars"

Until the Renaissance period, the study of human behavior was primarily delegated to the philosophers, who attempted to make inferences concerning human behavior using logical or rational methods. By 1600, however, unquestioning acceptance of authority and faith in logic was giving way to direct observation of natural phenomena and the inductive method now used by scientists. For the next two centuries, however, attention was directed to natural phenomena or specific physical processes rather than human behavior.

In the early 19th century, there developed a flourishing school of experimental physiology which was destined to have a great influence on the future science of psychology. Application of the experimental method to the study of the brain and the nervous system led to discoveries which in turn stimulated inquiries into the psychological bases of human thought, feeling, and behavior.

The advances made in experimental physiology led directly, about the middle of the 19th century, to the establishment of a new field known as psychophysics. Using the scientific approach, Gustav Fechner studied the relationship between sensation and the physical world. Psychophysics is the direct forerunner of experimental psychology. It concerned itself with determining the relationship between the physical characteristics of stimuli and the sensations they produce by measuring the amount of change that must be made in a physical stimulus to produce a psychological change.

In 1879, Wilhelm Wundt founded in Leipzig the first experimental psychology laboratory. The laboratory group dealt with the concept that "mental states," such as sensations, images, and feeling, formed the structure of consciousness. Hence, they became known as the structuralists. Theirs was essentially an analytical approach, that is, they believed that "mental states" were directly observable through introspection.

Around 1900, the American, John Dewey, founded the school of functionalism. Functionalism, like structuralism, is basically analytical. However, functionalism attempted to relate behavior to the "survival of the fittest" concept of Darwin. By emphasizing the function of the psyche in terms of behavior and adjustment to the environment rather than isolated mental states, the functionalist expanded the scope of psychology.

It was a third and later group of psychologists, the behaviorists, who made the most complete break with non-empirical approaches to psychology by devoting themselves exclusively to the study of observable behavior. "If you can't observe or test it, it isn't proper data for the science of psychology" the behaviorists insist. Therefore, behaviorists hold that such concepts as soul, mind, and unconsciousness have no place in empirical psychology.

This is the end of Summary 1. Go to the next page and take the Quiz.

Summary Pre-Quiz 1

Historical Development of Psychology

Answer the following question as indicated in your Student Guide.

---

1. This section discusses the general historical development of psychology. Below are several general types of approaches. Arrange them in a sequence showing the order of this historical development.

    a. Physiological 1st ____
    b. Superstitious 2nd ____
    c. Philosophical 3rd ____
    d. Analytical 4th ____
    e. Empirical 5th ____

---

2. Which of the following statements is correct concerning ancient explanations of human behavior?

    a. The belief was that the supernatural does not exist.
    b. The behavior of animals was directly related to the behavior of man.
    c. The behavior of man was attributed to the supernatural--it was believed that animal spirits or demons had invaded the body.
    d. A belief existed that behavior was some inner thing which could not be seen or heard.

3. Match the following.

   a. Made a complete break with any non-empirical approach
   b. Believed that "mental states" such as sensation, images, and feeling are the components of consciousness
   c. Attempted to relate psychology to man's adjustment to his environment

   1) Structuralism
   2) Behaviorism
   3) Imperialism
   4) Functionalism
   5) Psychophysics

   ____

4. Which statement is correct concerning the school of functionalism?

   a. Mental states make up man's behavior, and a man can be no more than the structure of his mental state.
   b. Certain areas of the brain control man's behavior.
   c. All things have a place in nature's plan, even man, if he would only live according to the golden rule.
   d. Functionalism relates psychology to man's adjustment to his environment; in particular, behavior to the "survival of the fittest" concept.

   ____

Now, check your answers on the next page.

ANSWERS TO SUMMARY PRE-QUIZ 1

1. 1-b, 2-c, 3-a, 4-d, 5-e
2. c
3. a-2, b-1, c-4
4. d

If all your answers are correct, go to Summary 2, page 17. If you missed one or more questions, go to the following page and go through Programed Sequence 1.

Programed Sequence 1

Historical Development of Psychology

OVERVIEW: In this sequence of frames, you will learn about the historical development of psychology. This will include primitive explanations, and later some philosophical concepts. You will also learn about the first major concepts of modern psychology.

---

1 Many primitives explain human behavior as being dependent on the work of spirits, good or evil.

Which statement below is correct?

a. A primitive might explain a man's unusual ability to run fast as being due to the deer spirit that possesses him.

b. Primitive explanations of man's behavior are generally superstitious.

c. Both of the above

d. None of the above

---

2 Until the Renaissance, logic and rational thought played an important part in the study of human behavior.

Which group of men would you consider as the most influential in forming the explanations of psychology during the Middle Ages?

a. The philosophers

b. The experimenters

3 Which of the following is based on the belief that spirits and demons control human behavior?

a. Structuralism

b. Psychophysics

c. Both of the above

d. None of the above

4 Select the statement which reflects the state of psychological explanation before the Renaissance.

a. Empirically-minded psychophysicists were putting the mind-body problem to the test.

b. The study of human behavior was the domain of the philosophers, who attempted to develop inferences concerning human behavior by using logic and reason.

5 During the Renaissance, the inductive method of investigation and a new attitude of respect for empirical evidence were becoming prevalent.

Which of the following would be consistent with this way of thinking?

a. Renaissance scientists tried to deduce every type of knowledge from ancient sources.

b. Renaissance scientists observed events and formulated general laws on the basis of such observations.

c. Both of the above

d. None of the above

6 In the early part of the 19th century, physiologists began to work on an experimental method of analysis of the nervous system. A particular problem of interest was "What physical stimuli cause a nerve fiber to 'fire'?"

Which of the following would be a result of this approach?

a. Such experiments would stimulate inquiries into the physiological bases of human thought, feeling, and behavior.

b. Such experiments tend to favor the idea that sensory and mental functions are localized in a particular part of the body rather than in a hypothetical "mind" separated from the body.

c. Both of the above

d. None of the above

---

7 Psychophysicists, too, concluded that the mind and body are inseparable and must be considered as a single integrated unit. They concerned themselves with studying the differential effects that various amounts of physical stimuli have on the perceptions of these stimuli.

Which form may such experiments take?

a. Varying the candle power of light intensity and determining the perceived brightness of it

b. Eliminating the basic assumption of the mind-body problem

8 The activity which studies perceived sensations as a function of the physical properties of the stimuli is called psychophysics.

Which of the following would psychophysics study?

a. The relationship between the spirit world and sensations

b. The relationship between philosophy and physiology

c. Both of the above

d. None of the above

---

9 A midshipman tells another midshipman, "Your horoscope indicates that you will flunk this course."

From which approach might you expect such an explanation about human behavior?

a. An experimental approach

b. A philosophical approach

c. Both of the above

d. None of the above

---

10 Which of the following is an example of psychophysics?

a. A person listens to a sound of particular pitch. The frequency of the sound is increased until the person reports a noticeable difference in pitch.

a. A rat was subjected to an increasing dosage of heat until his skin began to blister.

11 Toward the end of the 19th century, some approaches to psychology led to the development of certain "schools." The first of these schools was a laboratory group known as the "Structuralist School." Their main belief was that certain mental constructs form the structure of consciousness.

Which could you assume to be the basic concept of the Structuralist School?

a. Mental states such as sensation, images, and feeling form the structure of consciousness.

b. If you can't build with it or test for it, it isn't a part of behavior.

---

12 Functionalism, the next school, was based on the analysis of man's actions in adjusting to the conditions of his surroundings.

Which of the following would be of basic interest to the functionalists?

a. The functionalists analyze man in terms of his mental components.

b. The functionalists relate psychology to man's behavior in response to his environment.

---

13 To which school does the assertion that "mental states form the structure of consciousness" apply?

a. Experimental

b. Structuralist

14 Which of the following is true of the structuralist?

a. He tries to discover the psychological basis for certain behavior by studying conscious experience.

b. He uses theories derived from empirical studies of behavior as the foundation on which to build basic concepts concerning psychology.

---

15 A person attempting to attribute abnormal behavior to man's inability to adjust to our modern complex world might turn to which of the following for support?

a. Structuralist

b. Functionalist

---

16 A third school of psychology, the behaviorists, rejected such constructs as a soul, mind, or unconscious. The behaviorist accepts as data only what he can directly observe or test for.

Which of the following statements characterizes a behaviorist?

a. Controlled experimentation is necessary to the development of psychology.

b. Even though we all know that spirits do not exist, they may have a place in science because they allow us to explore unknowns.

17 Match the following.

a. Made a complete break with any non-empirical approach

b. Believed that mental states form the structure of consciousness

c. Attempted to relate psychology to man's adjustment to his environment

1) Psychophysicist

2) Behaviorist

3) Structuralist

4) Functionalist

This is the end of Programed Sequence 1. Now, go to the next page and take the Quiz.

Summary Post-Quiz 1

Historical Development of Psychology

Answer the following questions as indicated in your Student Guide.

---

1. This section discusses the general historical development of psychology. Below are several general types of approaches. Arrange them in sequence.

   a. Empirical
   b. Analytical
   c. Physiological
   d. Superstitious
   e. Philosophical

   1st ____
   2nd ____
   3rd ____
   4th ____
   5th ____

---

2. Which of the following statements is correct concerning ancient explanations of human behavior?

   a. The belief existed that the supernatural does not exist.

   b. The behavior of animals was directly related to the behavior of man.

   c. A belief existed that behavior was some inner thing which could not be seen or heard.

   d. The behavior of man was attributed to the supernatural, i.e., to animal spirits or demons that had invaded the body.

3. Match the following.

   a. Made a complete break with any non-empirical approach

   b. Believed that "mental states" such as sensation, images, and feeling formed components of consciousness

   c. Attempted to relate psychology to man's adjustment to his environment

   1) Imperialism

   2) Functionalism

   3) Structuralism

   4) Psychophysics

   5) Behaviorism

4. Which statement is correct concerning the school functionalism?

   a. Functionalism relates psychology to man's adjustment to his environment; in particular, behavior to the "survival of the fittest" concept.

   b. Mental states make up man's behavior, and a man can be no more than the structure of his mental state.

   c. Certain areas of the brain control man's behavior.

   d. Believed that all things have a place in nature's plan, even man, if he would only live according to the golden rule.

Now, go to the next page and check your answers.

ANSWERS TO SUMMARY POST-QUIZ 1

1. 1-d, 2-e, 3-c, 4-b, 5-a
2. d
3. a-5, b-3, c-2
4. a

Now, go to Summary 2 on the next page.

Summary 2

Overgeneralization About Human Behavior

Most attempts at explaining human behavior are not really explanations, but merely generalizations about human behavior based on casual observations. The following list of common generalizations is provided to illustrate the overgeneralization concept. Go through the list and write either true (T) or false (F) for each item on a separate piece of paper.

1. Geniuses are usually more eccentric than people of average intelligence.
2. Only human beings, not animals, have the capacity to think.
3. Much human behavior is instinctive.
4. Slow learners retain what they learn better than fast learners.
5. Intelligent people form most of their opinions by logical reasoning.
6. A psychologist is a person who is trained to psychoanalyze people.
7. You can size up a person quite well in an interview.
8. When one is working for several hours, it is better to take a few long rests than several short ones.
9. The study of mathematics exercises the mind so that a person can think more logically on other subjects.
10. Grades in college have little to do with success in business careers.
11. Alcohol, in small amounts, is a stimulant.
12. There is a clear distinction between the normal person and one who is mentally ill.

13. Prejudices are mainly due to lack of information.
14. Competition among people is characteristic of most human societies.
15. The feature of a job that is most important to employees is the pay they get for their work.
16. It is possible to classify people fairly well as either introverts or extroverts.
17. Punishment is an effective way of eliminating undesirable behavior in children.
18. By closely watching a person's expression, you can tell the emotion he is experiencing.
19. The higher one aims for his goals in life, the more he is likely to accomplish and the happier he will be.
20. If a person is honest with you, he can usually tell you what his motives are.

None of the above items is true. That does not mean the statements are completely false. The one thing which they share in common is that they are all generalizations. Everyday speech is full of generalizations. Statements such as Australians are all athletic, Scots are all thrifty, gentlemen prefer blondes, a sailor has a girl in every port, etc., are examples of very broad, sweeping generalizations. Even though such statements have elements of truth in them, they are false in their basic assumptions. The problem in psychology is to differentiate between those generalizations which are very subtle half-truths, and those which have sufficient validity to be taken as truth.

A half-truth usually originates in some casual observation that has been overgeneralized, and the inferences made often result in some kind of stereotype. Often, the origin of a particular half-truth is lost, but it persists because of tradition. For example, many old wives' tales linger on in our general folklore even though scientific psychology has proven them false. Half-truths often become so widely accepted that they deter from the investigation of the subject.

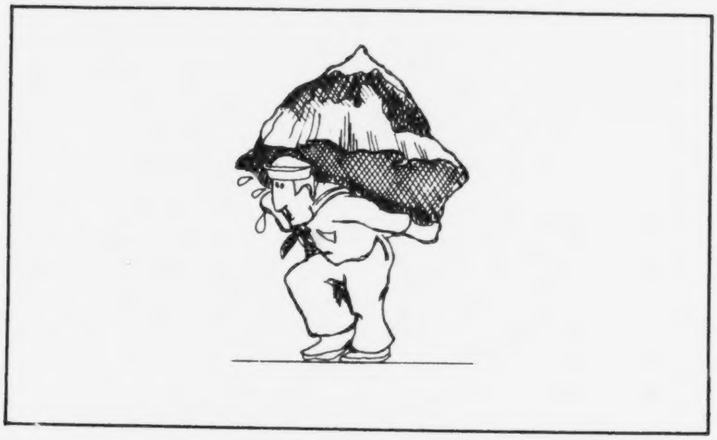

Figure 2. Sweeping Generalizations:
Men Can Move Mountains

This is the end of Summary 2. Now, go to the next page and take the Quiz.

Summary Pre-Quiz 2

Overgeneralization About Human Behavior

Answer the following questions as indicated in your Student Guide.

---

1. The statement "Italians make the best opera singers," is an example of which of the following?

   a. A half-truth

   b. A fact

   c. A generalization

   d. Both a and c above

---

2. Which statement explains the existence of half-truths about behavior?

   a. Half-truths exist because scientists cannot prove them completely right or completely wrong.

   b. Behavior observed in one person at one particular time may also be exhibited by other people having the same attributes.

   c. Half-truths usually originate in generalizations which are overstated.

3. Which of the following statements is true concerning generalizations?

   a. Generalizations about behavior inevitably lead to half-truths.

   b. Generalizations are statements which cannot be proven.

   c. Generalizations about human behavior often result from casual observations.

   d. None of the above

Now, check your answers on the next page.

ANSWERS TO SUMMARY PRE-QUIZ 2

1. d
2. c
3. c

If all your answers are correct, go to Summary 3, page 29. If you missed one or more questions, turn to the following page and go through Programed Sequence 2.

Programed Sequence 2

Overgeneralization About Human Behavior

OVERVIEW: In this sequence of frames, you will learn about the validity of generalizations. You will learn the cause of such generalizations and their effect when used in explaining human behavior.

---

1 A girl said, "I've met a couple of midshipmen and they all seem to be snobs." Which is true?

a. Midshipmen are snobs.

b. She must be overgeneralizing.

---

2 Half-truths usually start when someone occasionally observes something, then generalizes about it. Which could you assume?

a. That half-truths occur only when something can't be proven.

b. That the origin of half-truths is usually some casual observation that has been overgeneralized.

3 ENS McDow has just graduated from the Naval Academy and reported to the USS Dark for duty. McDow is seen carrying a load of about 60 books aboard the ship. Several of McDow's peers sneeringly make the comment that McDow had graduated No. 1 in his class. Some of the men believe that McDow is a little weird because he likes to read and study a lot.

Which of the generalizations below would be considered a half-truth?

a. With that kind of academic record, McDow must be very intelligent.

b. Anybody who spends that much time reading books would have difficulty being a practical officer.

---

4 Half-truths usually are generalizations about human behavior which deviate from the norm of the general population.

Which is true?

a. Half-truths are broad, sweeping generalizations about normal human behavior.

b. Half-truths are often used to explain eccentric human behavior.

c. Both of the above

d. None of the above

5 People find half-truths useful in explaining deviate human behavior because half-truths help form a standard view of all people who share these deviate attributes.

Which of the following is characteristic of a half-truth?

a. Inferences made from generalizations often result in some kind of a stereotype.

b. Whatever view is formed is only temporary, and no harm will be done.

---

6 Obviously, not all generalizations are half-truths. Which of the following examples illustrates a valid generalization?

a. CPO Donaldson, a veteran of 23 years of Navy service, is seen one night by some of his men at a local club having a few drinks. Immediately, one of the sailors chances to remark, "There's the chief drunk again." Actually, Donaldson has never been seen drunk since entering the service. After that night, everyone secretly refers to Chief Donaldson as "the Drunk."

b. CPO Mitchell, a veteran of 18 years of Navy service, is known throughout the Navy as one of the top CPO's in the Navy. Like many Navy men, Mitchell has had his ups and downs, but always comes out well. Everywhere Mitchell goes, people expect nothing but the best from him, and he generally lives up to their expectations.

7 Half-truths often become so widely accepted that they deter further investigation of the subject. Which inference is justified by that statement?

a. Most people feel that once an event has been "labeled" there is no need for continued investigation.

b. The stereotype of the opera singer as an Italian causes more Italian boys to aspire to become opera singers.

---

8 Select the phrase which does not apply to half-true statements.

a. Often broad, sweeping generalizations

b. Lead to formation of stereotypes

c. Must be accepted at face value

d. Tend to be used as labels, thereby discouraging further investigation

---

This is the end of Programed Sequence 2. Now, go to the next page and take the Quiz.

Summary Post-Quiz 2

Overgeneralization About Human Behavior

Answer the following questions as indicated in your Student Guide.

---

1. The statement, "Italians make the best opera singers," is an example of which?

   a. A fact

   b. A half-truth

   c. A generalization

   d. Both b and c above

---

2. Which statement explains the existence of half-truths about behavior?

   a. Half-truths usually result from overstated generalizations.

   b. Half-truths exist because scientists cannot prove them completely right or completely wrong.

   c. Behavior observed in one person at one particular time may also appear in other people of like attributes.

---

3. Which of the following statements is true concerning generalizations?

   a. Generalizations are statements which cannot be proven.

   b. Generalizations about human behavior often result from casual observations.

   c. Generalizations about behavior inevitably lead to half-truths.

   d. None of the above

Now, check your answers.

ANSWERS TO SUMMARY POST-QUIZ 2

1. d
2. a
3. b

Now, go to Summary 3 on the next page.

Summary 3

Differences Between Psychology and Psychiatry

The terms "psychology" and "psychiatry" are often confused. Psychology is classically defined as "the science of human and animal behavior." Psychiatry, on the other hand, is "a branch of medicine specializing in the study, diagnosis, and treatment of mental illness." These two disciplines overlap and complement each other in the areas of abnormal human behavior, psychoanalysis, and psychotherapy.

Psychology has developed into a large body of systematized knowledge that is now a teachable science. Systematized psychological knowledge is primarily concerned with learning, testing, social behavior; behavior which can be observed, recorded and studied.

The Comprehensive Dictionary of Psychological and Psychoanalytical Terms (English and English, 1964) differentiates between the professions in the following way.

> A psychologist is a person who has made an extensive study of psychology (usually the equivalent of 3 years of graduate study) under professional guidance.
>
> A psychiatrist, on the other hand, is (generally) a person licensed to practice medicine, who is engaged professionally in the prevention, diagnosis, treatment and care of mental illness.

This is the end of Summary 3. Now, go to the next page and take the Quiz.

Summary Pre-Quiz 3

Differences Between Psychology and Psychiatry

Answer the following questions as indicated in your Student Guide.

---

1. Which of the following statements is true of psychology?

   a. Humans are studied by psychologists because only humans exhibit abnormal behavior.

   b. Psychologists employ electric shock and drugs while administering therapy.

   c. Psychology is primarily concerned with the mind, thoughts and emotions.

   d. Psychology is a large body of systematized knowledge concerned with learning, testing, social behavior, etc.

---

2. Which of the following statements is true of psychiatry?

   a. Psychiatry is a branch of the behavioral sciences.

   b. Psychiatry deals primarily with the biological makeup of man.

   c. Psychiatry is a direct outgrowth of medicine concerned with mental disorders.

   d. Psychiatry is a branch of psychology concerned with the study of abnormal behavior.

3. Which of the statements best describes the distinctions between psychology and psychiatry?

   a. Psychiatry is practiced by doctors who specialize in mental disorders. Psychology is the study of the behavior of men and animals.

   b. The difference between psychology and psychiatry is that psychology is the scientific study of the behavior of men and animals, and psychiatry is the study of how all living things grow, repair their bodies, reproduce their kind, and carry on their bodily processes.

   c. Psychiatry is the study of the physical evolution of mankind, the origins of racial groups and the development of civilizations. It has provided many explanations concerning the behavior of different racial groups and its investigations are continuing to uncover new behaviors. Psychology is simply the study of the behavior of any organism.

   d. None of the above

   ____

4. Which of the following defines psychology?

   a. The science of the behavior of men and animals

   b. The study of the origins of racial groups

   c. The science of life

   d. A study of the physical evolution of mankind

   ____

Now, check your answers on the next page.

ANSWERS TO SUMMARY PRE-QUIZ 3

1. d
2. c
3. a
4. a

If all of your answers are correct, go to Summary 4, page 39. If you missed one or more questions, go to the next page and go through Programed Sequence 3.

Programed Sequence 3

Differences Between Psychology and Psychiatry

OVERVIEW: In this sequence of frames, you will learn the difference between psychology and psychiatry, and the factors which differentiate them from each other.

---

1 Psychology is the study of the behavior of men and animals. It is an attempt to explain why they behave in the way they do.

Which might you assume to be a function of psychology?

a. To attempt to explain animal behavior
b. To determine why people behave the way they do
c. Both of the above
d. None of the above

---

2 What is the science that studies the behavior of men and animals called?

a. Psychiatry
b. Psychology

3 Psychology is a large body of systematized knowledge which can be taught and which is the best foundation for developing an understanding of both normal and abnormal behavior. It includes all data relevant to any form of behavior.

Which of the following statements is true?

a. Psychologists may be concerned with conditions which affect learning.

b. Psychologists may be concerned with techniques appropriate to the correction of abnormal behavior.

c. Both of the above

d. None of the above

4 In the past, medical doctors were required to care for those who experienced mental disorders. The branch of medicine established specifically for the treatment of mental disorders is called psychiatry.

Which is true?

a. Psychiatry was an outgrowth of medicine.

b. Psychology was an outgrowth of psychiatry.

5 The main concern of psychiatry is the treatment of mental disorders.

Which could you assume?

a. Psychiatrists are often concerned with the behavior of rats in a maze.

b. Psychiatrists are often concerned with proper diagnosis and treatment of a patient whose behavior is abnormal.

6 Which of the following is a true statement concerning psychiatry?

a. Psychiatry is a direct outgrowth of medicine, and is concerned with mental disorders.

b. The primary subject of psychiatry is abnormal behavior.

c. Both of the above

d. None of the above

---

7 Match the following.

a. Science of behavior of men and animals

b. A direct outgrowth of medicine concerned with mental disorders

c. Studies the evolution and origin of man

d. Studies the physical makeup of man and applies it to other sciences

e. Systematized body of knowledge which forms the best foundation for developing and understanding behavior

1) Psychiatry

2) Psychology

3) Both of the above

4) None of the above

This is the end of Programed Sequence 3. Now, go to the next page and take the Quiz.

Summary Post-Quiz 3

Differences Between Psychology and Psychiatry

Answer the following questions as indicated in your Student Guide.

1. Which of the following statements is the definition of psychology?

    a. A study of the physical evolution of mankind

    b. The science of life

    c. The science of the behavior of men and animals

    d. The study of the origins of racial groups

2. Which of the following statements is true of psychology?

    a. Psychology is a large body of systematized knowledge concerned with learning, testing, social behavior, etc.

    b. Humans are studied by psychologists because only humans exhibit abnormal behavior.

    c. Psychology is primarily concerned with the mind, thoughts and emotions.

    d. Psychologists employ electric shock and drugs while administering therapy.

3. Which of the following is true of psychiatry?

    a. A branch of psychology concerned with the study of abnormal behavior

    b. A direct outgrowth of medicine concerned with mental disorders

    c. Deals primarily with the biological makeup of man

    d. A branch of the behavioral sciences

____

4. Which of the following statements best describes the distinctions between psychology and psychiatry?

    a. Psychiatry is the study of the physical evolution of mankind, the origins of racial groups, and the development of civilizations. It has provided many explanations concerning the behavior of different racial groups and its investigations are continuing to uncover new behaviors. Psychology is simply the study of the behavior of any organism.

    b. The difference between psychology and psychiatry is that psychology is the study of the behavior of organisms, and psychiatry is the study of how all living things grow, repair their bodies, reproduce their kind, and carry on their bodily processes.

    c. Psychiatry is practiced by doctors who specialize in mental disorders. Psychology is the study of the behavior of men and animals.

    d. None of the above

____

Now, check your answers on the next page.

ANSWERS OF SUMMARY POST-QUIZ 3

1. c
2. a
3. b
4. c

Now, go to Summary 4 on the next page.

Summary 4

The Study of Human Behavior Related to Principles of Leadership

The study of human behavior is directly related to leadership. An effective military leader must understand the relationship between one person and a group, or more specifically the relation of himself to his subordinates. In addition, knowledge of human behavior, on a psychological level, will dispel superstitious half-truths and allow a leader to understand why individuals and groups behave the way they do.

While dispelling half-truths (i.e., faulty generalizations), one must take care not to condemn all generalizations. Generalizations allow us to proceed beyond the present situation, formulate a principle, and predict or influence some future situation.

Prediction via generalization is not the only value of a principle. Principles may be useful in controlling or influencing a situation. To be of influential value,the generalization must be more rigorous and exact than is required for explanation. Hypotheses or theories which psychologists have rigorously tested can be used with confidence by a leader. If a leader understands human behavior, he will be able to influence the behavior of his subordinates to accomplish his mission in the manner desired, and to successfully motivate a group of people to accomplish a mission. Probably of greater importance than theories are certain procedures devised by psychologists. Such

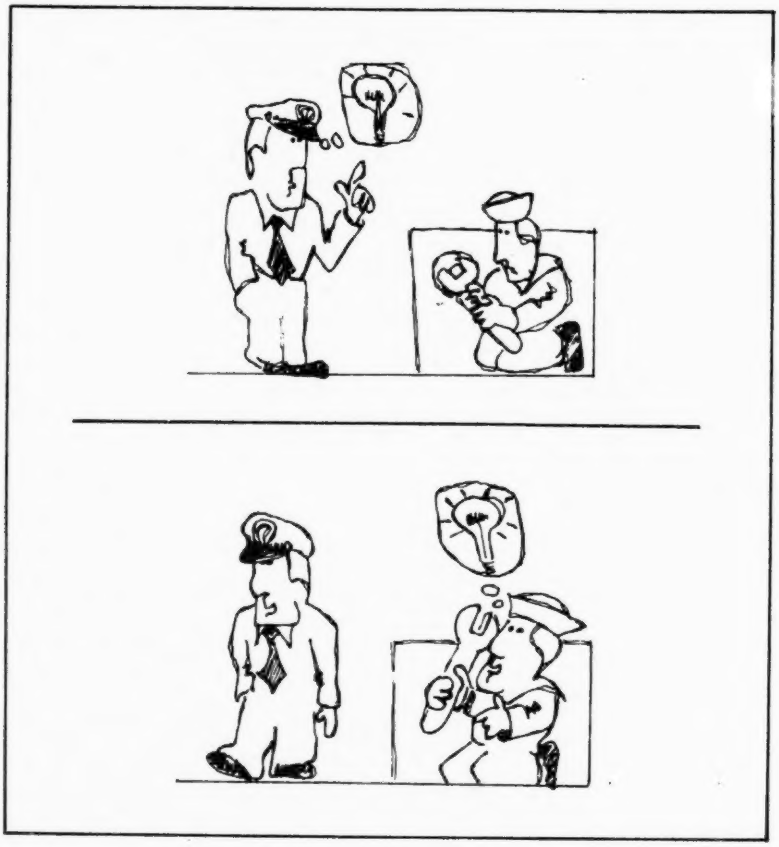

Figure 3. Motivation: Leader Implements Idea by Making Subordinate Think Idea is His Own

techniques as shaping behavior through differential rewards, or increasing the accuracy of performance through feedback, have been well established and will provide many solutions to leadership problems.

Present-day psychological research has developed many procedures for the modification of behavior which have been validated and tested. By having a good knowledge of these procedures and principles, the leader can efficiently and effectively influence the behavior of the individuals with whom he reacts. Psychological behavior-modifying procedures are generally of two types--training procedures, and motivational procedures.

Training procedures directly modify behavior to accomplish an objective. An example of this behavior modification is the technique used by the Armed Services that attempts to control the future behavior of the men by presenting them during training with problems that simulate real conditions.

Motivational procedures strive to impart knowledge relevant to motivating people to accomplish a mission. Proper motivation by the leader results in improvement of morale which increases the efficiency of performance by his subordinates.

This is the end of Summary 4. Now, go to the next page and take the Quiz.

Summary Pre-Quiz 4

The Study of Human Behavior Related to Principles of Leadership

Answer the following questions as indicated in your Student Guide.

---

1. Which of the following is/are true of generalizations?

   a. Generalizations develop into fact through tradition.

   b. They have predictive value.

   c. They are of no use to a leader.

   d. To be used as a basis for formulating a theory, a generalization must be more exact than is required for explanation.

---

2. Which phrase describes why it is valuable for the leader to be knowledgeable in procedures that have been developed by psychological research?

   a. To know how severely to discipline the men

   b. To effectively give rewards after losing control of a group situation

   c. To effectively control and influence people

   d. To explain human behavior

3. Why do we study psychology?

   a. To make predictions free of half-true generalizations, which often cloud good judgment

   b. To explain human behavior so that a leader can make reasonable predictions of the future actions his men may take, and make these predictions free of half-true generalizations, which too often cloud judgment

   c. To provide a leader with tested techniques that he may use to influence his men

   d. All of the above

Now, check your answers on the next page.

ANSWERS TO SUMMARY PRE-QUIZ 4

1. b, d
2. c
3. d

If all your answers are correct you have finished this segment. If you missed one or more questions, go to the next page and go through Programed Sequence 4.

Programed Sequence 4

The Study of Human Behavior Related to Principles of Leadership

OVERVIEW: In this sequence of frames, you will learn the reasons for studying human behavior, and how knowledge of human behavior can help you to influence and successfully motivate people.

---

1 There are many reasons for studying human behavior, but the primary purpose is to develop understanding of people. Basically, leadership is applied psychology.

Which would you say is the main reason for studying the science of human behavior?

a. To learn general principles which can be used in solving some of the problems of leadership

b. To learn psychology theories because they are interesting

---

2 Because psychology is an empirical (testable) science, its principles can be stated in a form which can be validated or rejected.

What would be another reason for studying human behavior?

a. To create psychological tests

b. To correct any superstitious half-truths that a leader may have before he studies psychology

3 Why do we study human behavior?

a. To correct superstitious half-truths

b. To learn valid techniques useful in influencing people

c. Both of the above

d. None of the above

---

4 A generalization is any inference that goes beyond the present data. Which of these is a generalization?

a. "Sir, every time the pressure reaches 50 PSI, the safety valve blows. The safety valve must be defective."

b. "Sir, even though we haven't tested them yet, I think all these valves are defective because they look just like the ones which broke down last week."

c. Both of the above

d. None of the above

---

5 All generalizations have potential predictive value. Given the generalization, "All restaurants in Paris serve delicious food," what might you predict?

a. That Italian restaurants are bad

b. That Rene's restaurant on the Left Bank in Paris serves good food

6 Generalizations which are too sweeping or imperfectly stated lead to faulty predictions. Such a generalization we call a:

a. Half-truth

b. Procedure

---

7 Valid, well-tested generalizations are most reliable for making predictions. But even invalid generalizations may have some predictive validity. Thus, what could one say about an invalid generalization?

a. It should be rejected if an alternate valid generalization is available.

b. If no alternative is available it may be helpful if used with caution.

c. Both of the above

d. None of the above

---

8 For the most part, well tested generalizations form the principles of psychology. Techniques that have been used to accomplish reliable changes in behavior are based on these principles.

Which of the following is a tested generalization?

a. To learn the Morse Code, one must practice.

b. Only the human animal has the ability to think.

9 A psychologist conducted an experiment and found that men scored lower on tests of finger dexterity than did women. Such a finding is:

a. Useful for prediction

b. Useful for influencing behavior

c. Both of the above

d. None of the above

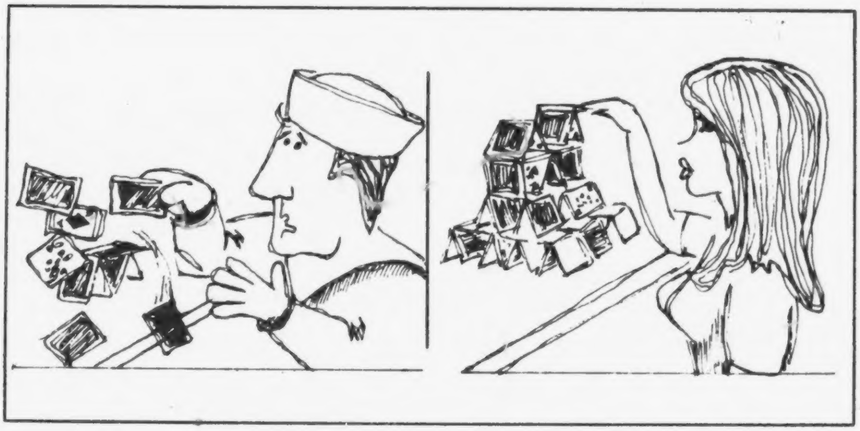

Figure 4. Explanation/Prediction: Manual Dexterity Difference Between Men and Women

10 A psychologist conducted an experiment and found that farm children who had driven a tractor learned to drive a car more rapidly than those who had not had this experience. In this case, the generalization might be used:

a. As an explanation useful for prediction

b. To allow us to design a procedure which would make learning to drive a car easier

c. Both of the above

d. None of the above

11 Which of the following examples illustrates a generalization useful for influencing behavior?

a. The old Navy belief that if you have a tattoo of a chicken on one leg and a pig on the other, you won't drown if you should fall overboard

b. A leader can implement his ideas by making the subordinate think the idea is his own.

12 Psychology deals with individual as well as with group behavior. What would be a reason for studying human behavior in a course of leadership?

a. To understand why individuals and groups behave the way they do

b. To be able to create reasons for excuses when things go wrong

This is the end of Programed Sequence 4. Now, go to the next page and take the Quiz.

Summary Post-Quiz 4

The Study of Human Behavior Related to Principles of Leadership

Answer the following questions as indicated in your Student Guide.

---

1. Which of the following statements is/are true of generalizations?

   a. They have predictive value.

   b. They are of no use to a leader.

   c. To be used as a basis for formulating a theory, a generalization must be more exact than is required for explanation.

   d. Generalizations develop into fact through tradition.

---

2. Which of the following statements describes why it is valuable for the leader to be knowledgeable in procedures that have been developed by psychological research?

   a. To explain human behavior

   b. To effectively give rewards after losing control of a group situation

   c. To know how severely to discipline the men

   d. To effectively control and influence people

3. Why should a leader study psychology?

   a. To learn tested techniques that he may use to influence his men

   b. To be able to make predictions free of half-true generalizations, which often cloud good judgment

   c. To understand human behavior so as to be able to make reasonable predictions of the future actions his men take, and to make these predictions free of half-true generalizations, which too often cloud judgment

   d. All of the above

Now, check your answers on the next page.

ANSWERS TO SUMMARY POST-QUIZ 4

1. a, c
2. d
3. d

This is the end of Part Two, Segment I.

United States Naval Academy

INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PART TWO
INDIVIDUAL BEHAVIOR

Segment I
Introduction to Psychology

Progress Check

WESTINGHOUSE LEARNING CORPORATION
Annapolis, Maryland
1971

INTRODUCTION TO PSYCHOLOGY

PROGRESS CHECK

Question 1.

An early school of psychology concerned itself with the study of the total behavior and experience of the individual and the function served by this behavior in an individual's adjustment to his environment.

Select the name usually given to this approach to psychology.

a. Behaviorism
b. Structuralism
c. Empiricism
d. Functionalism

Question 2.

A prominent school of psychology stressed that if psychology was to be considered a truly empirical science, it should concern itself only with observable and testable behavior.

Select the name usually given to this approach to psychology.

a. Structuralism
b. Functionalism
c. Empiricism
d. None of the above

Question 3.

If one resorts to using half-truths in explaining behavior, the effect is likely to be:

a. An acceptable set of generalized, non-stereotyped inferences

b. Widespread unwillingness to accept the explanation because half-truths have insufficient validity to be taken as truth

c. A wide acceptance of the half-truths as truths and a deterence from further investigation of the subject

d. An acceptance of general folklore as truth and a deterence of further generalization

Question 4.

Select the statement which explains the existence of half-truths concerning human behavior.

a. Many psychologists are trained so thoroughly that their ability to communicate is impaired.

b. Behavior theory is generally abstract, and permits students to reach erroneous conclusions.

c. Many people overgeneralize after only casual observation of behavior.

d. Behavior theory, by its nature, is extremely nebulous, and accurate conclusions are becoming increasingly difficult to establish.

Question 5.

Select the phrase which best completes the following sentence.

The difference between psychology and psychiatry is that:

a. Psychology is the study of the mind, thought, and feelings, while psychiatry is the study of the behavior of organisms.

b. Psychology is an outgrowth of medicine and psychiatry is an academic discipline.

c. Psychology is the study of the behavior of organisms, and psychiatry is the study of the mind, thoughts, and feelings.

d. Psychology is a more narrow approach to behavior than is psychiatry.

Question 6.

Which of the following best describes the defining attributes of psychology?

a. Cognition, abnormality, and characteristic psychoses.

b. A systematized body of knowledge which can be taught with behavior representing the main subject because it alone can be observed, recorded and studied.

c. Emphasis on animal behavior studies as the foundation for developing an understanding of behavior.

d. Mind, thoughts, and feelings are the basis of behavior, and social interaction is the vehicle used by psychologists to reach individuals.

Question 7.

Select the phrase which best completes the following sentence.

It is valuable for a midshipman to study human behavior in a leadership course because:

a. Mission accomplishment is based on the correct application of learned psychological principles.

b. An understanding of human behavior is a universal criterion utilized by promotion boards.

c. An understanding of human behavior can lead to more efficient and more effective leadership and mission accomplishment.

d. An understanding of human behavior enhances the character of the officer concerned.

Question 8.

Select the words which correctly complete the following sentence.

Psychiatry is a direct outgrowth of __________, and is concerned with __________ disorders.

a. Psychology, social

b. Sociology, physical

c. Anthropology, emotional

d. Medicine, mental

Question 9.

Select the statement which identifies why an officer should be able to explain human behavior.

a. An officer can provide more professional psychological advice to his men.

b. An officer can better identify those statements about human behavior which are overgeneralizations of half-truths.

c. An officer can devise more sophisticated methods of coercing his men to act in an abnormal manner.

d. An officer will be promoted faster if he can apply modern psychological methods to the leadership techniques generally found in the Armed Forces.

Question 10.

Select the statement which identifies a benefit derived from the leader's ability to influence human behavior.

a. The leader's ability to influence human behavior will gain the attention of his superiors who will consider him for more interesting and challenging assignments.

b. The leader's ability to influence human behavior will result in deficient training techniques, thereby endangering the lives of many men who are attempting to accomplish a routine mission.

c. The leader's ability to influence human behavior can result in the more efficient, effective accomplishment of his mission.

d. All of the above

PROGRESS CHECK ANSWER AND REMEDIATION FORM

PART Two SEGMENT I

REMEDIATION TEXT Syndactic Text VOL-II-B

ITEM	ANSWER	REMEDIATION REFERENCE
1	d	Summary 1: Page 3
2	d	Summary 1: Page 3
3	c	Summary 2: Page 19
4	c	Summary 2: Pages 18-19
5	c	Summary 3: Page 29
6	b	Summary 3: Page 29
7	c	Summary 4: Page 39
8	d	Summary 3: Page 29
9	b	Summary 4, Page 39
10	c	Summary 4, Page 39
11	☐	
12	☐	
13	☐	
14	☐	
15	☐	

United States Naval Academy

INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PART TWO
INDIVIDUAL BEHAVIOR

Segment II
Behavior and Its Observation

Syndactic Text
Single Volume
(ST/SV)

WESTINGHOUSE LEARNING CORPORATION
Annapolis, Maryland
1971

FOREWORD

> *"Little minds are interested in the extraordinary; great minds in the commonplace."*
>
> *Elbert Hubbard*

A prominent biologist tells the story of his early training under Louis Agassiz, the famed Swiss zoologist. When reporting to Professor Agassiz to begin his study, the biologist was seated at a table on which lay a fish. The young student, after looking at the fish for several hours, finally reported back to the professor asking what needed to be done. Agassiz asked him, "What did you see on the table?" When he responded, "Nothing but a dead fish," he was told to go back and check again. Several hours later he worked up his courage to report again that all he saw was a fish. It was in his third day that the aspiring student, out of a sense of frustration and boredom, began to note some of the features; the position and patterning of the scales, the texture and structure of the corpus and, almost without realizing it, began to make notes and diagrams on what he was discovering. He was there until Professor Agassiz stopped by to check with his question, "What do you see?" The student almost exploded with enthusiasm about what he was learning from the observation, and showed the professor his notes and diagrams. Professor Agassiz said, "You are beginning," and went away smiling.

BEHAVIOR AND ITS OBSERVATION

Summary 1

Types of Behavior and Methods of Observation

Many people think of psychology as the "science of the mind." Psychologists, however, consider this description to be limiting and inexact. They prefer to call psychology the "science of behavior." In this summary, we will examine three basic types of behavior. Then we will discuss how behavior may be observed and measured.

Overt Behavior

An officer salutes as he steps on deck before he formally requests permission to come aboard. This is an example of overt behavior. Overt behavior is any behavior which can be readily observed or detected by others. Saluting, nodding, walking, or any activities which involve motion, are classified as motor responses. Note, however, that people also respond by using words, either spoken or written. These are called verbal responses. Motor and verbal responses both constitute overt behavior.

Covert Behavior

Now let us consider another kind of behavior, exemplified in your own life by your decision to attend the Naval Academy.

You may have discussed the alternatives available to you with friends, advisors, parents, etc., but you then inwardly considered the alternatives and decided on a course of action. No one could have seen or heard these thought processes going on in your mind. These behaviors were not observable. Yet, they were a form of behavior. We call behavior which cannot be directly observed by others--which cannot be seen or heard by others--covert behavior.

Thinking, visualizing and projecting are all examples of covert behavior. So also are our physical responses which are so imperceptible that they cannot be observed or detected without instruments; for example, tonus of the muscles, quickening of the pulse, "butterfly sensations" in the stomach, etc. All of our inner actions and reactions are examples of covert behavior.

Affective Behavior

Sometimes, covert behavior may be evidenced by or inferred from overt behavior. Consider a midshipman sitting in the classroom. His eyes stare intently at the instructor. He appears to be thoroughly absorbed by the instructor's remarks. These are elements of overt behavior. At one point in the lesson, the instructor deals rather vaguely with a complex idea. The midshipman's expression changes to one of puzzlement and worry. We can infer a covert response (confusion, lack of understanding) from the midshipman's overt behavior (puzzled look). We call such discernible covert behavior affective behavior. Another good example of affective behavior is fear. We cannot observe the covert behavior of fear itself, but we can observe some overt physiological behavior, e.g., cold sweat, which indicates the presence of fear. A careful observer may infer the presence of covert, affective behavior from the overt behavior which it stimulates. The instructor may assume, for instance, that the midshipman does not understand the lesson, and then act accordingly.

As you can see, psychologists tend to define behavior in terms of how it is observed by others. We shall discuss here four methods of observing behavior, the casual, the natural, the introspective, and the experimental.

Casual Observation

Turn to page 8 and take a quick look at the picture in Figure 1. Then cover up the picture and think about what you saw. You may or may not have noticed the number of midshipmen who gathered on the fantail of the ship. You may or may not have noticed that some of them seemed to be rather ill. Did you notice exactly how many midshipmen were in the illustration? Or, did you notice what proportion of them were ill? We shall assume that you were practicing casual observation. Casual observation is simple, haphazard noticing of things around you. Now, if you happen to notice that the midshipman who is seated next to you in the library has gone to sleep, you have made another casual observation.

The vast proportion of observation is casual. Casual observation is not scientific because it is not accompanied by scientific thought. Science attempts to discern patterns and relationships in the ordering of observed phenomena; casual observation does not.

Natural Observation

Look again at Figure 1, and study it to see if the midshipmen have anything in common. This time you can see that all three of the ill men are in working uniform while the others are not. Now, you are making a natural observation. Natural observation is what psychologists call the process of observing things in a careful and systematic way to determine if patterns or relationships exist.

We commented earlier that you might "happen" to notice that the man beside you in the library was asleep. You may have found this interesting or amusing, but then you returned your attention to your reading. You made a casual observation. Suppose, however, that you saw the same man asleep each time you visited the library, and you decided to make a scientific study of his library sleeping habits. At this point, you might begin making natural observations as to the times he fell asleep, the length of his naps, the library temperature, the content of the book over which he falls asleep, and so forth. You keep some record of your observations and make a study of your data in an effort to find patterns of cause and effect. Natural observation is one of the cornerstones of scientific inquiry.

Introspective Observation

A man lying on a psychoanalyst's couch is engaged in making introspective observations--a third kind of observation. Rather than looking at external phenomena as he would do in the course of casual or natural observations, he is looking inward. He is trying to observe his own thoughts, feelings and emotions in order to report them to the analyst. He makes a conscious effort to observe his own conscious processes and states. A person who simply feels depressed is not making introspective observations. Introspection requires that person to note that he is depressed and perhaps continue the introspection by noting the feelings and the thoughts which accompany the depression. Introspection is obviously not an ideal method of scientific inquiry, since people usually are not objective about their own inner reactions. Nor can their observations be checked by another observer. However imperfect introspective observation may be, it is the only feasible way to evaluate certain phenomena.

Experimental Method of Observations

Suppose you have made a casual observation--a fellow midshipman is asleep in his room. You could make a number of natural observations about the nature of his sleep.

You cannot really be sure why he is asleep unless you employed another method of observation--the experimental method. There are any number of factors which could bear on the central fact that the midshipman is asleep. The time of day, the temperature, the impending lesson and the midshipman's own health, diet and nocturnal habits are only a few of the potential factors here. If you were making natural observations about the midshipman's sleep, you might note these factors. However, when using the experimental method of observation, you would attempt to evaluate the effect of each of these factors by manipulating and controlling some of them. The behavior of the individual changes when his environment is made to change or vary. Thus, in the experimental method of observation, the interest is focused on changes--the changes which occur in an individual's behavior as a result of changes in his environment. Each factor that is capable of change is known as a variable. If you feel very warm and someone adjusts the thermostat to change the temperature of the room, your degree of discomfort and the temperature of the room are both variables.

The experimental method employs two kinds of variables, independent and dependent. The independent variable is the variable which the experimenter alters in the hope of producing a reliable change in another variable--the dependent variable. The experimenter is interested in observing the effects of the independent variable on behavior. For example, he may want to determine the effect of a student's simultaneously hearing and seeing a list of words on his ability to remember the list. The independent variable in this case is the combination of auditory and visual presentation. The dependent variable is the number of errors which the student makes when he is recalling the list.

In any experiment there are elements or conditions which the experimenter does not intend to manipulate. These elements could, nevertheless, have some effect on the dependent variable if not held constant.

If our experiment is to be valid, we must exercise control over them. For example, the varying degree of student familiarity with the words in a list to be memorized, the amount of competing auditory or visual stimuli (that is, people walking around, talking, and so forth), the length of time allowed for study of the list, are all factors which affect the dependent variable (the number of errors made by the student in recalling the list).

This is the end of Summary 1. Now turn to page 9 and take the Quiz.

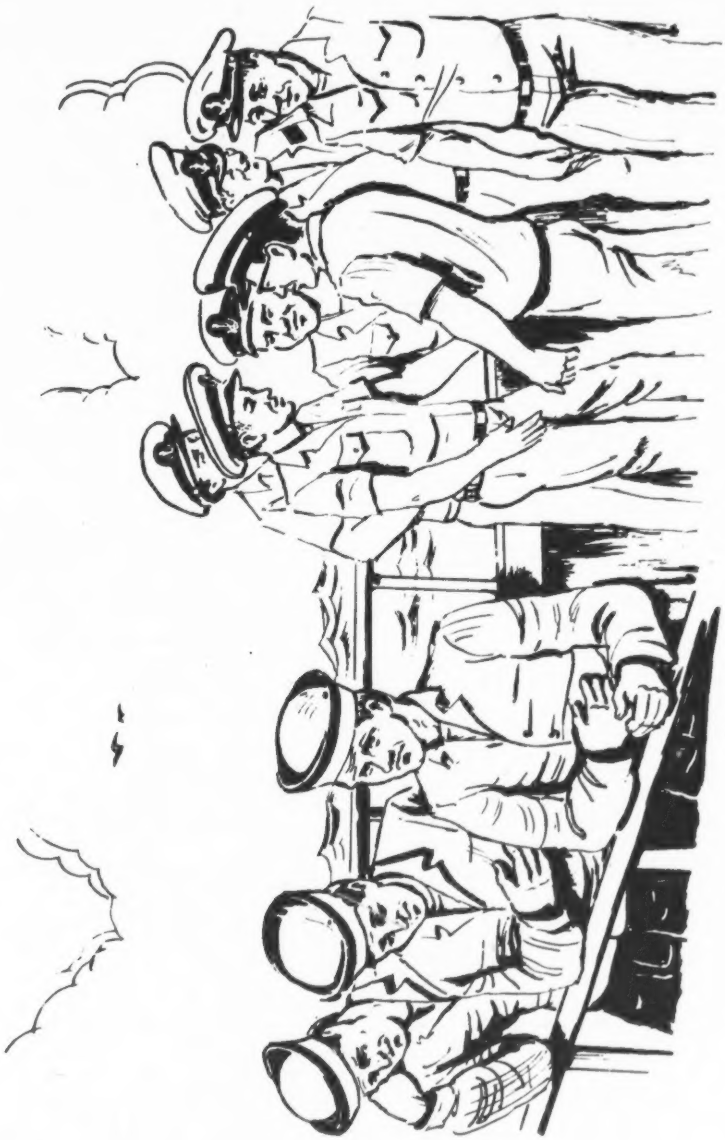

Figure 1

Summary Pre-Quiz 1

Types of Behavior and Methods of Observation

Answer each of the following questions as instructed in your Student Guide.

1. A seaman has been seriously injured aboard a ship. The Executive Officer brings to the Captain the following report from the Medical Officer: The injured seaman can be treated aboard ship, but he would receive better treatment if flown to a hospital ashore.

Which of the following responses made by the Captain are overt? (There may be more than one correct answer to this question.)

a. He asks the Executive Officer to stand by for a few minutes.

b. He considers the possible consequences of each alternative.

c. He thinks about the cost in time and man-hours to send the seaman ashore.

d. He gives his decision to the Executive Officer.

2. Which of the following responses reflect affective behavior? (There may be more than one correct answer to this question.)

a. A sailor's neck gets red as he is being congratulated by his fiancee's mother.

b. A midshipman thinks about last night's date.

c. A junior officer begins to sweat and shake as he is going into battle.

d. A Captain greets his men as he boards ship.

3. Match the following. (Note: There may be more than one description matched against any one kind of behavior. One or more of the descriptions may not match any of the kinds of behavior.)

a. Covert behavior
b. Affective behavior
c. Overt behavior

1. Verbal and motor responses which can be readily observed by others
2. Behavior which cannot be readily observed by others
3. Emotional behavior which can be inferred from overt responses
4. All learned behavior

---

4. Match the following. (Note: There may be more than one description matched against any one kind of behavior.)

a. Casual observation
b. Natural observation
c. Introspective observation

1. Describing one's feelings after seeing a fellow officer wounded in battle
2. Nonsystematic and simple observation of behavior
3. Noting and recording the number of times an individual stutters during a speech
4. An observation whose validity cannot be checked by another observer
5. Describing one's sensations when submerging in a submarine for the first time
6. Overhearing a conversation at a beach while on shore leave

5. Which of the following statements best describes the experimental method of observation?

a. The experimental method is based on the control of factors in the environment in order to differentiate the dependent from the independent variables in behavior.

b. The experimental method attempts to evaluate the effect of certain factors on behavior by manipulating and controlling some of them and studying the changes which are effected.

c. The experimental method attempts to evaluate the changes in the independent variable caused by manipulating and controlling changes in the dependent variable.

d. The experimental method attempts to evaluate the effect of all environmental factors on behavior by manipulating and controlling individual variables in turn until valid conclusions may be reached.

Turn to the next page and check your answers.

ANSWERS TO SUMMARY PRE-QUIZ 1

1. a, d
2. a, c
3. a-2, 3, b-3, c-1
4. a-2, 6, b-3, c-1, 4, 5
5. b

If all your answers are correct, go on to Summary 2 on page 29. If you missed one or more questions, go to the next page and go through Programed Sequence 1.

Programed Sequence 1

Types of Behavior and Methods of Observation

OVERVIEW: In this programed sequence you will learn about three different types of behavior, overt, covert, and affective. You will also become familiar with four methods of observing behavior, the casual, the natural, the introspective, and the experimental methods.

---

1 Psychologists call any kind of behavior which can be readily observed or detected by others overt behavior.

Which of the following would psychologists define as overt behavior?

a. Smiling
b. Blushing
c. Saluting
d. Doubting

---

2 Overt behavior is which of the following?

a. Any behavior which involves observing or detecting
b. Any behavior which can be readily observed by others
c. Any behavior which cannot be readily observed by others.
d. None of the above

3 Overt behavior includes observable physiological responses, e.g., blushing, perspiring, and motor activities, responses which involve motion, e.g., running, nodding.

Shedding tears is an example of which kind of overt behavior?

a. Motor response

b. Observable physiological response

c. Both of the above

d. None of the above

---

4 Overt behavior also includes any responses involving words, either spoken or written.

Which of the following would be considered verbal responses?

a. A handshake

b. Signing a check

c. Saying "thank you"

d. Frowning

---

5 Which of the following is not overt behavior?

a. A verbal response

b. A motor response

c. A visible physiological response

d. An imperceptible physiological response

6 Behavior which can not be readily perceived by others, e.g., thinking, hoping, visualizing, evaluating, is defined in psychology as covert behavior. Covert behavior includes physiological reactions which are so imperceptible that they cannot be detected without instruments, e.g., "butterflies in the stomach," quickening of the pulse, and tonus of the muscles.

Match the terms with the correct definitions.

a. Overt behavior
b. Covert behavior

1. Readily perceptible physiological responses
2. Imperceptible physiological responses
3. Motor responses
4. Verbal responses
5. "Inner" actions and reactions, e.g., thoughts, feelings

---

7 When you contemplated attending the Naval Academy you inwardly considered the alternatives available to you and "decided" to attend. Your decision involved both covert and overt behavior.

Match the behavior with the appropriate term.

a. Covert behavior
b. Overt behavior

1. Considering the alternatives available to you
2. Desiring to attend the Academy
3. Discussing the alternatives with advisors, friends, parents, etc.
4. Hoping to succeed plebe summer
5. Arriving at the Academy at the beginning of plebe summer

8 Overt behavior refers to responses which are readily observable by others, and covert to those responses which are not readily observable by others. Sometimes, however, covert behavior may be reported or betrayed by some overt behavior. For example, a puzzled look on a student's face is overt behavior which tells the teacher that the student is probably experiencing a covert feeling of confusion. We call covert behavior (in this case, the feeling of confusion) which is evidenced by some overt behavior (e.g., puzzled look) affective behavior.

Which of the following best defines affective behavior?

a. Covert behavior which is evidenced or reported by some overt behavior.

b. Overt behavior which is evidenced or reported by some covert behavior.

c. Covert behavior which is readily observable by others.

d. None of the above

---

9 When a person who is overcome with fear breaks out in a cold sweat, his fear is covert behavior, but the cold sweat is overt behavior which suggests quite clearly that he is experiencing fear.

In the case described above, which is the affective behavior?

a. The cold sweat

b. The feeling of fear

c. Both of the above

d. None of the above

10 A careful observer may infer the presence of some covert affective behavior by noting the overt behavior which it stimulates.

Which example below illustrates an awareness of affective behavior?

a. The lecturer, noting a look of puzzlement on a midshipman's face, asks if there are any questions, and rephrases his statement.

b. The lecturer, noting a look of puzzlement on the midshipman's face, continues his lecture, assuming that the midshipman was probably daydreaming.

---

11 You may have noticed that in our discussion of kinds of behavior, we tend to define behavior in terms of how it is observed by others. We shall look now at several ways in which behavior may be observed. The first method of observation is one you engage in whenever you "happen to notice" something about a person's behavior. This is called casual observation. For example, should you note that the midshipman next to you in the library has fallen asleep over his book, you would be practicing casual observation.

Which of the following exemplifies casual observation?

a. A junior officer constantly notes his senior's treatment of subordinates to find out what kind of behavior gets rewarded and what kind gets punished.

b. A junior officer noticed on one occasion that his senior was absentminded, and thereafter made an effort to remind him tactfully of appointments.

12 The vast proportion of observation is casual. Casual observation is not scientific because it is not accompanied by scientific thought. Science attempts to discern patterns and relationships in the ordering of observed phenomena; casual observation does not.

We mentioned earlier the casual observation you might make of a colleague asleep over his book. Supposing however, that you decided to make a study of the number of midshipmen falling asleep in that particular part of the library. You might begin by making natural observations about the times people tend to fall asleep, the library temperature, whether or not the student was taking notes, etc. You would have to keep a record of your observations and then study your data to see if you could discern patterns of cause and effect. Your study would be the result of natural observation, a way of observing behavior which is quite different from casual observation.

If a mountain climber keeps a careful diary in which he notes physical reactions of himself and his men to the extreme temperatures and high altitude, which kind of observation is he performing?

a. Casual

b. Natural

---

13 Which best defines natural observation?

a. Keen and persistent observation of behavior in a natural environment.

b. Occasional discovery, by chance, of a pattern of cause and effect in behavior.

14 Still another kind of observation is introspection. The person lying on the psychoanalyst's couch is performing this kind of observation. Introspection is an attempt to observe one's own thoughts and feelings and accurately report them--in this case, to the analyst.

Which of the following people is using the introspective method of observing behavior?

a. A midshipman who feels depressed and because of this gets angry at his roommate

b. A midshipman who feels depressed and attempts to combat the depression by trying to analyze his feelings and sort out the cause of his depression.

c. Both of the above

d. None of the above

---

15 Introspection is not an ideal method of scientific inquiry as it calls for people to be objective about their inner reaction. Furthermore, it is not possible to check introspective observations for their accuracy. Despite these shortcomings, introspection is still the only feasible way to evaluate certain phenomena.

Introspection would be most useful in studying which kind of behavior?

a. Overt

b. Covert

c. Both of the above

d. None of the above

16 We have discussed the casual, the natural, and the introspective approaches to observing behavior.

Match the description with the appropriate method of observation.

a. Natural

b. Casual

c. Introspective

1. Attempt to observe one's own conscious processes and states, such as thoughts and emotions.

2. Haphazard observation of a person's behavior

3. Keen and persistent observation of a person's behavior

4. Attempt to control a person's behavior in order to study it scientifically

---

17 A fourth method of observing behavior is the experimental approach. Let us go back to the example we had cited earlier of the midshipman asleep in the library. There are any number of factors which could bear on the central fact that the midshipman is asleep; the time of day, the temperature of the room, the midshipman's nocturnal habits, etc. If you used the experimental method, you would attempt to evaluate the effect of each of these factors by manipulating and controlling some of them. In other words, you would manipulate the environment and study the effect this has on the individual's behavior.

The experimental method focuses attention on which of the following?

a. Changes which occur in the environment as a result of changes in an individual's behavior.

b. Changes which occur in the individual's behavior as a result of changes which occur in the environment.

18 When using the experimental method to observe behavior, we call each factor that is capable of change a variable. If you felt very warm and adjusted the thermostat to change the temperature of the room, your degree of discomfort and the temperature of the room would both be variables.

Supposing you noticed that you developed an eye twitch after watching television for a certain number of hours. The amount of time you had spent watching television and the incidence of your eye twitch would be considered which of the following?

a. Values

b. Variables

c. Experimental observations

d. Affective behavior

19 The experimental method employs two kind of variables, independent and dependent. The independent variable is the variable which the experimenter alters in the hope of producing a reliable change in another variable, known as the dependent variable. Supposing you were to apply the experimental method of observation to the eye twitching behavior mentioned in frame 18. You might shorten the time you spent viewing television to see if it had any effect on the occurrence of eye twitches.

How would the variables in the experiment be correctly described?

a. The independent variable would be the incidence of eye twitches, and the dependent, the length of time spent watching television.

b. The independent variable would be the length of time spent watching television; the dependent, the number of times spent watching television before the eye twitches began.

c. The independent variable would be the length of time spent watching television; the dependent, the incidence of eye twitches.

20 In any experiment there are elements or conditions which the experimenter does not intend to manipulate or measure. Nonetheless, these elements could have some effect on the dependent variable if they were not held constant. For example, to study the effect of the amount of time spent in TV watching on the incidence of the eye twitch, we would have to keep constant such other factors as the amount of light in the television room, the size and height of the TV screen, the amount of eye use in other daily activities.

Thus, in order to conduct a valid experiment, which of the following would have to be done?

a. The independent variable should be changed, and the other variables should be held constant or controlled.

b. The independent variable should be held constant, as the interest will be focused on its effect on the dependent variable.

c. The experiment should be controlled so that there are no variables other than the dependent and independent variables.

This is the end of Programed Sequence 1. Now turn to the next page and take Summary Post-Quiz 1.

Summary Post-Quiz 1

Types of Behavior and Methods of Observation

Answer each of the following questions as instructed in your Student Guide.

---

1. Which of the following responses reflect affective behavior? (There may be more than one correct answer to this question.)

   a. A Captain greets his men as he boards ship.

   b. A junior officer begins to sweat and shake as he is going into battle.

   c. A midshipman thinks about last night's date.

   d. A sailor's neck gets red as he is being congratulated by his fiancee's mother.

---

2. A seaman has been seriously injured aboard a ship. The Executive Officer brings to the Captain the following report from the Medical Officer: The injured seaman can be treated aboard ship, but he would receive better treatment if flown to a hospital ashore.

   Which of the following responses made by the Captain are overt? (There may be more than one correct answer to this question.)

   a. He considers the possible consequences of each alternative.

   b. He asks the Executive Officer to stand by for a few minutes.

   c. He thinks about the cost in time and man-hours to send the seaman ashore.

   d. He gives his decision to the Executive Officer.

3. Match the following. (Note: There may be more than one description matched against any one kind of behavior. One or more of the descriptions may not match any of the kinds of behavior.)

a. Covert behavior

b. Affective behavior

c. Overt behavior

1. All learned behavior
2. Emotional behavior which can be inferred from overt responses
3. Behavior which cannot be readily observed by others
4. Verbal and motor responses which can be readily observed by others

---

4. Which of the following statements best describes the experimental method of observation?

a. The experimental method attempts to evaluate the changes in the independent variable caused by manipulating and controlling changes in the dependent variable.

b. The experimental method attempts to evaluate the effect of all environmental factors on behavior by manipulating and controlling individual variables in turn until valid conclusions may be reached.

c. The experimental method is based on the control of factors in the environment in order to differentiate the dependent from the independent variables in behavior.

d. The experimental method attempts to evaluate the effect of certain factors on behavior by manipulating and controlling some of them and studying the changes which are effected with each change.

5. Match the following. (Note: There may be more than one description matched against any one kind of behavior.)

a. Introspective observation

b. Casual observation

c. Natural observation

1. Describing one's feelings after seeing a fellow officer wounded in battle

2. Nonsystematic and simple observation of behavior

3. Noting and recording the number of times an individual stutters during a speech

4. An observation whose validity cannot be checked by another observer

5. Describing one's sensations when submerging in a submarine for the first time

6. Overhearing a conversation at a beach while on shore leave

---

Now check your answers on page 28.

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ANSWERS TO SUMMARY POST-QUIZ 1

1. b, d
2. b, d
3. a-3, 2; b-2, c-4
4. d
5. a-1, 4, 5; b-2, 6; c-3

Now, go to the next page and go through Summary 2.

Summary 2

Application of the Experimental Method

Four steps are followed in applying the experimental method to the observation of behavior.

1) Identify, isolate, and observe the dependent variable, i.e., that one specific aspect of behavior you wish to study. For example, you might wish to study the ability of a certain fourth classman to do pullups.

2) Introduce an independent variable. Potentially, there are a large number of independent variables which could be introduced. In the case of pullups, you can vary the amount of sleep the fourth classman gets before the testing period. You can vary his diet, or assign rewards for high achievement--and so on. Finally, you select one variable and make a rough estimate of what the results of introducing it might be.

3) Control all other variables. It is important that all other conditions of the environment be held constant. For example, room temperature should be kept at the same level for each test period, since temperature variation may invalidate the test. If we select the amount of sleep as the variable, then diet must be held constant.

4) Observe the results of the experiment. Observation in this instance usually takes the form of recording the effects of the independent variables on the dependent variables. You can compare the number of pullups accomplished after four

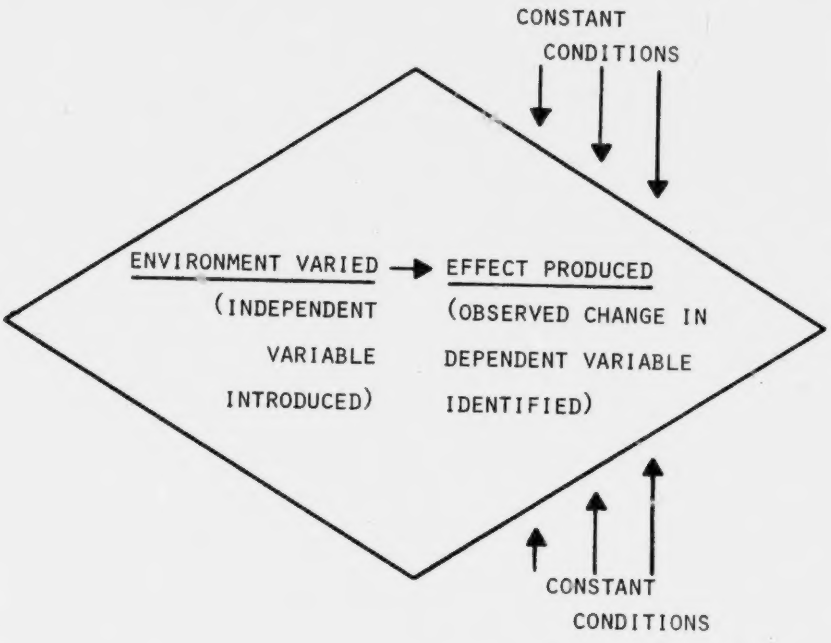
hours of sleep to the number accomplished after eight hours of sleep--or, the number after a well-balanced meal to the number accomplished on an empty stomach.

Figure 2 on page 31 contains a model which should help you review the steps to be followed in the experimental method.

Outcomes of the Experimental Method

The experimental method should yield three useful results. First of all, a description is obtained. Suppose that our testing showed that midshipmen consistently performed better when scheduled before noon for pullups, as compared to when scheduled during the evening hours. The statement: "Performance was improved by shortening the period between getting up and exercising." constitutes a *description* of relationships between the independent and dependent variables.

The second result is prediction. On the basis of our descriptions of the tested relationships, we usually can make *predictions* regarding performance which we have *not* tested. From the experiment, we obtained a description: "Performance was improved by shortening the period between getting up and exercising."


CONSTANT CONDITIONS
ENVIRONMENT VARIED
(INDEPENDENT VARIABLE INTRODUCED)
EFFECT PRODUCED
(OBSERVED CHANGE IN DEPENDENT VARIABLE IDENTIFIED)
CONSTANT CONDITIONS

STEPS OF THE EXPERIMENTAL METHOD

1. Identify the dependent variable.
2. Introduce an independent variable.
3. Hold all other conditions (relevant variables) constant.
4. Observe results.

Figure 2

We can probably now predict that performance will be improved if testing were accomplished immediately after the midshipmen got up, even though we have not actually tested performance at that time. The experimental method produces, in short, an understanding of the relationships between independent and dependent variables.

This understanding makes possible the third result, control. Control is the ability to manipulate future behavior. For example, the summer platoon leader has learned through experimentation that when he conducts realistic rifle range snapping in drills in a pleasant environment vastly improved performance generally results. The experimental method yields, then, three useful results.

1) Description: a statement of the functional relationship between independent variable and dependent variable.

2) Prediction: a statement about an expected change in the dependent variable based on knowledge of the effects of the independent variable.

3) Control: an ability to manipulate behavior on the basis of previously determined descriptions and predictions.

Operational Definitions

Technology and science require the use of clear, precise definitions--terms which are accepted as having the same meaning by everybody who uses them. Confusion would result in the study of behavior if psychologists were not able to arrive at accepted and understood definitions. All scientists work with what they call "operational" definitions in order to ensure the clearest possible communications.

100

To understand the meaning of an operational definition, let's look at an example. Intelligence is a key concept in psychological study. Each of us probably has his own idea of what intelligence is, such as: the ability to get good grades, the ability to respond verbally, the ability to solve problems, etc. Psychologists avoid this confusion. They define intelligence in terms of the scores obtained on standard tests, and by other operations which they use for measuring intelligence. Thus, an operational definition of the word "intelligence" is a definition of intelligence specifically in terms of I.Q. (or some other) test..

It is extremely difficult to define certain concepts operationally. In certain cases, it may be necessary to impose an extremely arbitrary and limited definition for a term to be used scientifically. For example, a psychologist may decide to measure love in terms of the number of times a man and woman kiss each other within the course of one hour. His operational definition of love may be presented as: "that behavior of a man and woman kissing each other at least three times within the course of one hour." This is obviously an inadequate definition of love, but it is nonetheless useful for the psychologist attempting to explain the behavior of love.

In short, we can say that in psychology an operational definition is one which defines a behavior in terms of the observable operations used to measure it.

Intention-Performance Congruency

A good example of the use of an operational definition is the way psychologists would explain "will power" or "self-discipline." A psychologist would use an operational definition and say that this person exhibits "intention-performance congruency." What a person says about his future performance, oral or written, designates his intention. Thus, when a midshipman says, "I am going to quit smoking" this indicates an intention. What a person does, is his performance. Performance is any element of his behavior that we can observe or measure. The midshipman's successful avoidance of smoking is an example of performance. Finally, congruency indicates a state of agreement--agreement between the intention of an individual and his performance. In this case, the midshipman who intended to stop smoking, did, in fact, stop smoking. His intention and his performance were therefore in agreement. He exhibited intention-performance congruency--or "willpower." Clearly, not all expressed intentions are translated into positive action. Suppose, for example, that this midshipman announced his intention to stop smoking and then failed to do so. Perhaps we could say that the man has exhibited "weak will." A good operational definition of "weak will" could be "intention-performance incongruency." Intended behavior can either occur or not occur, as seen from the two preceding examples. Thus, if an officer on board ship states that he will not go ashore, and then he does go ashore, his behavior can be defined as manifesting intention-performance incongruency. Intention-performance provides a useful and easily communicated operational definition for use in observing and describing behavior.

This is the end of Summary 2. Now turn to the next page and take the Quiz.

Summary Pre-Quiz 2

Application of the Experimental Method

Answer the following questions as specified in your Student Guide.

1. Because the Physical Education Department was interested in the effects of water temperatures on swimming performance, it decided to apply the experimental method and varied the temperature of the natatorium from 80 degrees Fahrenheit to 60 degrees Fahrenheit. The swimming times of the class as related to the different temperatures were recorded and evaluated.

Which aspect of the experimental method was not adequately specified in the foregoing description?

a. Identifying the dependent variable

b. Introducing the independent variable

c. Holding constant all other conditions

d. Observing the experimental results

2. A friend tells you that he is going to the basketball game. On the way, he decides instead to spend the afternoon searching for a June Week rental.

What would be a good operational definition of his behavior?

a. His behavior shows intention-performance congruency.

b. His behavior shows intention-performance incongruency.

c. His behavior shows that he is unreliable.

d. None of the above

3. Match each of the terms with its definition.

a. Independent variable	1. A variable that changes as the result of a change in the environment introduced by the experimenter
b. Dependent variable	2. A variable which is manipulated in the hope of producing a reliable change in another variable
	3. A variable which cannot be manipulated

---

4. After observing the effects of various water temperatures on midshipmen's activities, the Physical Education Department heats the natatorium to 87 degrees Fahrenheit--the temperature which previously produced optimum performance.

What outcome of the experimental method is exemplified by this behavior?

a. Prediction

b. Extrapolation

c. Description

d. Control

5. The experimental method may lead to all but one of the following results.

Which of the following does not describe a result

a. Prediction

b. Control

c. Description

d. Operational definition

Now, check your answers on the next page.

ANSWERS TO SUMMARY PRE-QUIZ 2

1. c
2. b
3. a-2, b-1
4. d
5. d

If all your answers are correct, go on to Summary 3 on page 55. If you missed one or more questions, turn to the next page and go through Programed Sequence 2.

Programed Sequence 2

Application of the Experimental Method

OVERVIEW: In this programed sequence you will learn the four steps to be followed in applying the experimental method. Then, the useful results of the experimental method will be discussed. Finally, the need for operational definitions will be discussed, as well as how an operational definition may be applied to any common behavior.

---

1 The first step in applying the experimental method is to identify, isolate, and observe the particular independent variable you wish to study. For example, you might select as a subject the ability of a certain fourth classman to do pullups.

The swimming coach decides to apply the experimental method. He decides to try to increase performance of his swimmers by increasing the amount of time of practice sessions. "Increased performance" may mean faster times of individual swimmers, faster team times in relay races, better form in individual swimmers, greater endurance in practice sessions, etc.

The coach has failed to carry out which of the following steps in applying the experimental method?

a. Identify, isolate, and observe the particular variable you wish to study.

b. Introduce an independent variable.

2 After identifying the dependent variable, the next step is to introduce an independent variable. This means that you must select from the potentially large number of independent variables which could be introduced. For example, to increase the ability of a certain fourth classman to do pullups you might introduce the independent variable of varied amount of sleep, or a change in diet, or an assignment of rewards for high achievement, etc.

Match the steps with the appropriate description. (One description does not match either of the steps.)

a. Step 1-Identify the dependent variable.

b. Step 2-Introduce an independent variable.

1. Increase the number of reenlistments aboard a certain ship.

2. Observe the behavior of possible reenlistment candidates over a fixed period of time.

3. Initiate a series of counseling sessions and lectures on the advantages of reenlistment.

---

3 What are the first two steps to be followed in applying the experimental method?

a. One, introduce the dependent variable; and two, identify the independent variable.

b. One, introduce the independent variable; and two, identify the dependent variable.

c. One, identify the dependent variable; and two, introduce an independent variable.

4 The third step in applying the experimental method is to control all other variables. For example, if we were attempting to find out the effect of amount of sleep (independent variable) on the ability to do pullups (dependent variable), then we would have to hold constant such other potentially influential variables as diet, temperature of the room, other physical exercise engaged in, etc.

What is the third step in applying the experimental method?

a. Controlling the independent variable

b. Controlling variables other than the independent variable

c. Controlling the dependent variable

d. None of the above

---

5 Number the steps correctly.

a. Introduce an independent variable--Step____

b. Identify the dependent variable--Step____

c. Control all other variables--Step____

6 The fourth and final step is to observe the results of the experiment. This usually takes the form of recording the effect of the independent variable on the dependent variable. For example, you would compare the number of pullups accomplished after a well balanced meal to the number done on an empty stomach.

Which of the following might be a typical example of the fourth step in the experimental method?

a. Shortening the period between sleeping and exercising

b. Stating the hoped for results of introducing an independent variable

c. Identifying the dependent variable

d. Making a graph showing the number of pullups accomplished after varying periods of time between sleeping and exercising

---

7 Which correctly states the fourth step in applying the experimental method?

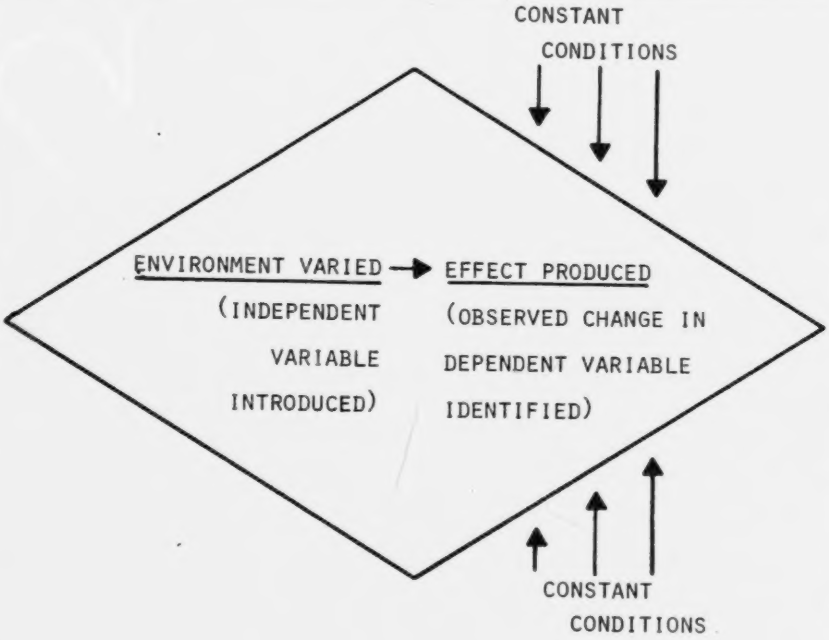
a. Predict the results of the experiment

b. Identify the dependent variable

c. Observe the results of the experiment

d. Control the dependent variable

8 Here for review purposes is a model which should help you recall the steps in the experimental method and their relationship to one another?


CONSTANT CONDITIONS
ENVIRONMENT VARIED
(INDEPENDENT VARIABLE INTRODUCED)
EFFECT PRODUCED
(OBSERVED CHANGE IN DEPENDENT VARIABLE IDENTIFIED)
CONSTANT CONDITIONS

STEPS OF THE EXPERIMENTAL METHOD

1. Identify the dependent variable.
2. Introduce an independent variable.
3. Hold all other conditions (relevant variables) constant.
4. Observe results.

9 The experimental method should yield three useful results: description, prediction, and control. Supposing that our testing showed that midshipmen performed consistently better at pullups when scheduled directly after rising, as compared to when scheduled during evening hours. The statement "Performance was improved by shortening the period between a night's sleep and exercising" constitutes which of the useful results?

a. Prediction

b. Control

c. Description

---

10 The experimental method, then, allows us to state a description of the tested relationship between dependent and independent variable. On the basis of our description we can usually make predictions regarding performance which we have not tested. Prediction is the second useful result of using the experimental method.

The statement: "Performance will be improved if midshipmen are scheduled for pullups immediately after getting up in the morning" constitutes which useful results of the experimental method?

a. Description

b. Prediction

c. Control

11 Because the experimental method provides us with an understanding of the relationship between dependent and independent variable, we can then not only describe and predict behavior, but we can also control it. Control is the third useful result of using the experimental method.

Which of the following illustrates the use of experimentation to control behavior?

a. The summer platoon leader has found out through experimentation that when he conducts realistic rifle range snapping in drills in a pleasant environment vastly improved performance generally resulted.

b. The summer platoon leader always conducts summer rifle range snapping in drills in a pleasant environment since he discovered through experimentation that vastly improved performance generally resulted.

12 Match the outcomes of experimentation with the appropriate description.

a. Description

b. Prediction

c. Control

1. An ability to manipulate behavior on the basis of previously determined outcomes

2. A statement about an expected change in a dependent variable based on a knowledge of the effects of the independent variable

3. A statement of the functional relationship between independent and dependent variables.

4. A generalization about the effect of an independent variable on other, non-tested dependent variables

---

13 Technology and science require the use of clear, precise definitions, terms which are accepted as having the same meaning by everybody who uses them. Thus, all scientists work with what are called operational definitions in order to ensure the clearest possible communication. An operational definition is one which defines a behavior in terms of the observable operations used to measure or detect it.

Which of the following might be an operational definition of intelligence?

a. The ability to get good grades

b. The ability to respond verbally on various subjects

c. The ability to solve problems

d. The ability to obtain a high score on a standard I.Q. test

14 As you can imagine, it is extremely difficult to define certain concepts operationally. It is often necessary to impose extremely arbitrary and limited definitions in order to use a term scientifically. For example, a psychologist might decide to measure love in terms of the number of times a man and woman kiss each other during the course of one hour. This is obviously not an adequate or universally agreed upon definition of love. It does, however, serve a useful purpose for the experimenter.

What is that purpose?

a. It prevents confusion and ensures clear communication because other people will know exactly what he is talking about when he discusses "love."

b. It points out to other people the absurdity of trying to define a concept such as "love."

15 A typical example of a psychologist's use of an operational definition is the way a psychologist would explain "willpower." Supposing a midshipman gave up smoking. You might say he showed "willpower," but "willpower" is difficult to define, measure or explain. A psychologist would say the midshipman displayed "intention-performance congruency," using an operational definition which lends itself easily to measurement and explanation.

Intention is what a person says about his future performance. In the case of the midshipman who gave up smoking, what constitutes the intention?

a. The midshipman's statement, "I am going to quit smoking."

b. The midshipman's statement, "I quit smoking."

c. The midshipman's desire to quit smoking

16 You may deduce that if intention is what a person says about his future behavior, then performance is: (Choose one.)

a. What a person wants to do

b. What a person actually does

c. What a person has done in the past

17 Finally, congruency is a state of agreement between the intention of the individual and his performance in view of that intention. The midshipman who stated that he would give up smoking and who did in fact give it up is exhibiting intention-performance congruency.

A midshipman who states he is going to quit smoking and then does not quit is exhibiting which of the following?

a. Intention-performance congruency

b. Intention-performance incongruency

---

18 Intention performance congruency can be either positive or negative. For example, an officer who states he will not go ashore and then in fact does not go ashore, he is exhibiting nonetheless intention-performance congruency.

If a seaman states he will not go ashore, and then does go ashore, how would you describe his behavior using an operational definition?

a. He exhibits intention-performance incongruency.

b. He exhibits intention-performance congruency.

This is the end of Programed Sequence 2. Now, go to the next page and take Summary Post-Quiz 2.

Summary Post-Quiz 2

Application of the Experimental Method

Answer the following questions as specified in your Student Guide.

---

1. Because the Physical Education Department was interested in the effects of water temperatures on swimming performance, it decided to apply the experimental method and varied the temperature of the natatorium from 80 degrees Fahrenheit to 60 degrees Fahrenheit to observe the swimming times of the class as related to the different temperatures.

Which aspect of the experimental method was NOT adequately specified in the foregoing description?

a. Observing the experimental results

b. Holding constant all other conditions

c. Introducing the independent variable

d. Identifying the dependent variable

---

2. A friend tells you that he is going to the basketball game. On the way, he decides instead to spend the afternoon searching for a June Week rental.

What would be a good operational definition of his behavior?

a. His behavior shows intention-performance incongruency.

b. His behavior shows that he is unreliable.

c. His behavior shows intention-performance congruency.

d. None of the above

3. Match each of the terms with its definition.

a. Dependent variable

b. Independent variable

1. A variable that changes as the result of a change in the environment introduced by the experimenter.

2. A variable which is manipulated in the hope of producing a reliable change in another variable.

3. A variable which cannot be manipulated.

---

4. After observing the effects of various water temperatures on midshipmen's activities, the Physical Education Department heats the natatorium to 87 degrees Fahrenheit--the temperature which previously produced optimum performance.

What outcome of the experimental method is exemplified by this behavior?

a. Control

b. Description

c. Extrapolation

d. Prediction

5. The experimental method may lead to all but one of the following results.

Which of the following does not describe a result

a. Description

b. Operational definition

c. Prediction

d. Control

Now, check your answers on page 54.

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ANSWERS TO SUMMARY POST-QUIZ 2

1. b
2. a
3. a-1, b-2
4. a
5. b

Now, go on to Summary 3 on the next page.

Summary 3

Adjustive Behavior

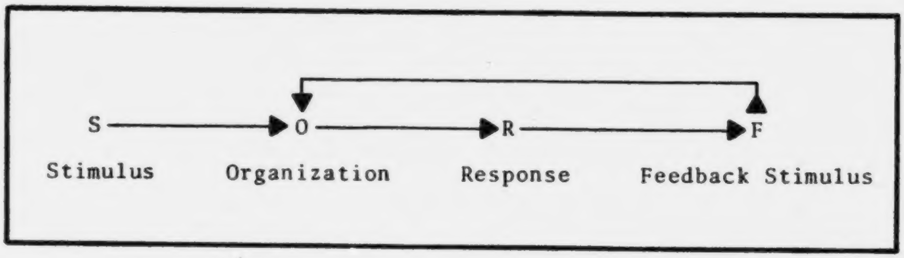
Psychologists have discovered that there are very definite, observable patterns of cause and effect present in almost all behavior. Consider, for example, the behavior of the Navy pilot who has been shot down over a jungle. Because he has consumed all of his emergency rations, he must depend upon what he can find, or trap, to eat. This pilot has had little nourishing food for many days. He tastes roots and tubers of plants which he finds along his route of travel. Let us translate this example into psychological terms, and say that this pilot was demonstrating adjustive, or adaptive behavior. Adjustive behavior occurs any time that an organism behaves as the result of demands developed from social or biological needs. Adjustive behavior is the main concern of psychology.

Conditioned responses from his survival training and going without nourishment produced the cause, or antecedent condition for the pilot's food-seeking behavior. The stomach contractions which resulted from lack of food also produced a stimulus. The definition for stimulus is: any antecedent or environmental condition which elicits behavior. Military orders such as verbal commands, written directives, calls to battle stations, are all stimuli which are familiar to you. The reaction which is made to a stimulus is a response. A response is anything which a person does as he reacts to a stimulus. The response may consist of behavior which is overt or covert. The pilot's first response is covert; he considers eating. The seaman's first response to a call to battle stations is overt; immediate, motor activity toward his station.

No adjustive behavior is purely automatic. Stimuli impinge upon the nervous system. These stimuli are sorted out and evaluated before an appropriate response is generated. This process of sorting and evaluating is called organization. By organization we mean those covert processes by which we assimilate and structure sensory information. Organization processes are always based upon both present conditions and past experiences of an individual. Consider again the situation of the downed pilot. He selected and tasted food which appeared to be edible, based upon his training and past experience and upon what was available. He uses covert mental processes in this behavior. Organization can occur at a conscious level or an unconscious level--or a combination of both. Being covert, organization processes can never be directly observed. Organization is inferred on the basis of response.

When an individual responds to a stimulus, this produces change in the environment. For example, a first classman is asleep in his room when the reveille bell sounds. A ringing bell stimulus impinges upon his condition. He gets out of bed. This act is the response to the stimulus. Now, as a result of the response, there is a new environmental condition. He is no longer asleep. He is awake and out of bed. He senses the cold temperature of the floor. Thus, the new environmental condition becomes a stimulus. As a stimulus, it can elicit further responses. Suppose that this were the midshipman's first day at the Academy. He might respond in a somewhat different manner by simply staying in bed. If so, he responds in a manner which does not conform to Naval Academy Regulations. Response does not conform to defined conditions of his new environment. When the new midshipman fails to conform to established Academy behavior by sleeping-in after reveille, he receives a reprimand. The first classman keeps a pair of clogs under his bed which he steps into in order to avoid the cold floor. Both of the resulting stimuli, the reprimand for sleeping in and the reward of warm comfortable feet, are examples of feedback. We might say that feedback occurs whenever the operation of a mechanism informs a behaving organism as to whether the behavior conforms to previously defined conditions. In other words, feedback is simply knowledge of results of a behavior. Remember, feedback can be positive as well as negative. It can include rewards or punishments. Once it has been assimilated, feedback then becomes a factor in the organization of future responses. Feedback can influence response in such a way as to modify future behavior of the individual. When a midshipman chooses to modify his future behavior because of the feedback stimulus of a reprimand, he is engaging in adjustive behavior.

A stimulus from the environment is assimilated and structured by the covert process we call organization. As a result of this organization, a response takes place. The response in turn creates a change in the environment. Environmental changes can function as feedback. Feedback then is detected and organized by the individual in much the same way that he organized the initial stimulus. As a stimulus, feedback can then serve to modify or confirm the individual's future responses.



We have identified adjustive behavior as behavior which depends on both its antecedents and its consequences. A person displays adjustive behavior when--after making a response to a particular stimulus, thereby effecting a change in the environment which provides him with feedback--he modifies his subsequent behavior.

This is the end of Summary 3. Now, go to the next page and take the Quiz.

Summary Pre-Quiz 3

Adjustive Behavior

Answer the following questions as specified in your Student Guide.

---

1. Match all of the numbered items with the appropriate lettered item.

   a. Stimulus
   b. Response
   c. Feedback

   1. Hearing the reveille bell
   2. Saluting a superior officer
   3. An environmental condition which elicits behavior
   4. Aiming a weapon at the target
   5. Viewing the target after each shot to see how close you came to the bull's-eye

---

2. Which one of the following is the correct definition of organization?

   a. Covert processes by which sensory information is structured and assimilated
   b. Activities by which organisms attempt to meet social and biological needs
   c. Anything which an individual says or does in reaction to environmental conditions
   d. Observable processes by which we assimilate and structure sensory information

3. Read the following numbered statements, then answer the question.

1) In a battle, a frigate is hit by a torpedo.
2) The Damage Control Assistant uses his past experience in such a situation, and his technical knowledge, and evaluates all elements of the situation.
3) The Damage Control Assistant orders emergency repairs.
4) The Damage Control Assistant receives a report from the damaged area that flooding has now been confined to two compartments.

Match the following lettered terms to the four situations listed above.

a. Organization
b. Response
c. Feedback
d. Stimulus

---

4. Which represents the correct definition of adjustive behavior?

a. A person displays adjustive behavior when--as a consequence of responding to a particular stimulus, thereby effecting a change in the environment which provides him with feedback--he modifies his future behavior.
b. A person displays adjustive behavior when--as a consequence of responding to a particular stimulus--he effects a change in his environment.

5. Which of the following provides a good definition of feedback? (There may be more than one correct response.)

   a. Any stimulus which is an environmental condition

   b. Any stimulus which serves to inform an individual of the suitability of his output

   c. Any stimulus which provides knowledge of results

   d. Any response which is a modification of previous behavior

---

Now, check your answers on the next page.

ANSWERS TO SUMMARY PRE-QUIZ 3

1. a-1, 2, 3, 4; c-5
2. a
3. a-2, b-3, c-4, d-1
4. a
5. b, c

If all your answers are correct you have finished this segment. If you missed one or more questions, go to the next page and go through Programed Sequence 3.

Programed Sequence 3

Adjustive Behavior

OVERVIEW: Psychologists have found that individuals adapt to or adjust to their environment according to a distinct, observable pattern of behavior. The process of adapting, called by psychologists adjustive behavior, will be discussed in this programed sequence. You will learn how the elements of stimulus, response, organization and feedback interact in the operation of adjustive behavior.

1 Here is an operational definition of adjustive behavior: A person displays adjustive behavior when, after making a response to a particular stimulus, he receives feedback (in the form of some change in the environment) and modifies his future behavior accordingly.

Here is an example of adjustive behavior. Read it, then answer the question on the next page.

A Navy pilot's plane has been shot down over a jungle. After his emergency rations have been used up he is motivated by a stimulus--hunger pangs, to seek food. His response is to taste roots and edible looking plants in an effort to relieve his hunger. Some plants and roots do relieve his hunger, thus providing him with feedback in the form of a change in the environment, i.e., he is no longer hungry. He then modifies his future behavior, i.e., continues to seek out and eat those roots and plants which relieved his hunger.

Match each of the elements of adjustive behavior with the appropriate part of the example.

a. Stimulus received

b. Organism reponds to stimulus

c. Change in environment notifies organism of suitability of its response

d. Organism modifies its behavior accordingly

1. Hunger is relieved by eating certain roots and plants

2. Pilot feels hunger pangs

3. Pilot seeks out potential food plants by tasting

4. Pilot seeks and eats those plants which still his hunger

$\boxed{2}$ A stimulus is any antecedent environmental condition which elicits the execution of behavior. In the example in frame 1, there may have been other stimuli besides hunger pangs influencing the pilot's behavior. For example, other stimuli might have been the pilot's knowledge (or experience from training) that one can survive on roots and tubers, or a suspicion that his crash had not been sighted and thus, that rescue might be a long time away.

Which of the following might be considered stimuli?

a. Verbal commands

b. Written directives

c. Desire for success

d. All of the above

3 A response is any reaction made by the organism to a given stimulus. Responses may be overt or covert. In the preceding situation, the pilot's first response to his stomach contractions was covert, he considered eating.

Which of the following best defines response?

a. A person's overt reaction to a stimulus

b. Anything which a person does, overt or covert

c. Anything which a person does overt or covert as reaction to a stimulus

d. A person's first reaction to a stimulus

4 No adjustive behavior is purely automatic. Stimuli are sorted out and evaluated on the basis of present condition of the organism and past experience before an appropriate response is generated. This sorting and evaluating process is called organization.

Which of the following is an appropriate description of the organization process?

a. Process by which sensory information is assimilated and structured, based on condition of the organism and past experience, before the response is generated

b. Process by which stimuli are sorted and evaluated after the response has been generated

c. None of the above

5 The organization process is always based on both present conditions and past experiences of the individual. The pilot in frame 1 selected and tasted food which appeared to be edible based not only on what was available to him, but also on his training and past experience with jungle vegetation.

Which of the following is true?

a. Organization process is based only upon present conditions and does not take into account past experience.

b. The organization process is based both on present conditions and past experiences of an individual.

6 Psychologists can only infer that organization has taken place by studying the response made by an individual to a given stimulus.

The pilot's seeking of food in plants and roots and not in trying to trap animals reflected that which of the following processes had taken place?

a. Coordination

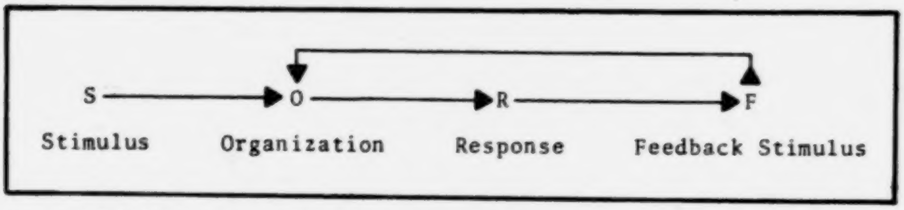
b. Assimilation

c. Organization

7 So far, we have discussed the part played by stimulus, organization, and response in the operation of adjustive behavior. A final element, feedback, completes the typical pattern of adjustive behavior.

8 Feedback, in the context of adjustive behavior, means simply "knowledge of results." The downed pilot tasted some plants and found them unpalatable, that they did not quell his hunger, or that they made him ill. This knowledge of the results of eating certain plants was acquired in and by making a response--i.e.--tasting what plants were available. Later this knowledge of results acted in itself as a stimulus and affected the pilot's future behavior, i.e., he no longer tasted those plant types which had been unsuitable for the above mentioned reasons.

Here is a diagram which illustrates the role played by feedback in adjustive behavior. Study the diagram, then answer the question.



Which of the following correctly states the role of adjustive behavior?

a. It is any stimulus which serves to provide knowledge of results, in other words, to inform an individual of the suitability of his output (behavior).

b. It is any response which is a modification of previous behavior.

c. It is any stimulus which is an environmental condition.

d. None of the above

9 When a new plebe fails to conform to established Academy standards by sleeping in after reveille, he receives a reprimand. Or, when a first classman steps into a pair of clogs to avoid the cold floor on winter mornings, he receives a reward (comfort). Both of the above exemplify feedback at work. The plebe receives knowledge of the results of his behavior in the form of a reprimand, negative feedback. The first classman found that by wearing his clogs he avoided the cold floor.

This created which of the following?

a. Positive feedback

b. Negative feedback

c. No feedback

---

10 Let's summarize what we have discussed about adjustive behavior: A stimulus from the environment is assimilated and structured by the covert process we call organization. As a result of this organization, a response takes place. The response in turn creates a change in the environment. Environmental changes can function as feedback. Feedback then acts as a stimulus, is detected and organized by the individual in much the same way that he organized the initial stimulus.

Which one of the following should you select as the best sequence for adjustive behavior?

a. Stimulus--organization--response--organization--feedback--response

b. Stimulus--organization--response--feedback--stimulus

c. Stimulus--feedback--organization--response

d. Stimulus--response--feedback--organization--response

SUMMARY: We have identified adjustive behavior as behavior which depends on both its antecedents and its consequences. A person displays adjustive behavior when--after making a response to a particular stimulus, thereby effecting a change in the environment which provides him with feedback--he modifies his subsequent behavior.

This is the end of Programed Sequence 3. Now, go to the next page and take Summary Post-Quiz 3.

Summary Post-Quiz 3

Adjustive Behavior

Answer the following questions as specified in your Student Guide.

---

1. Match all of the numbered items with the appropriate lettered item.

a. Feedback
b. Stimulus
c. Response

1. Hearing the reveille bell
2. Saluting a superior officer
3. An environmental condition which elicits behavior
4. Aiming a weapon at the target
5. Viewing the target after each shot to see how close you came to the bull's-eye

---

2. Which one of the following is the correct definition of organization?

a. Observable processes by which we assimilate and structure sensory information
b. Anything which an individual says or does in reaction to environmental conditions
c. Activities by which organisms attempt to meet social and biological needs
d. Covert processes by which sensory information is structured and assimilated

3. Read the following numbered statements, then answer the question.

1) In a battle, a frigate is hit by a torpedo.

2) The Damage Control Assistant uses his past experience in such a situation, and his technical knowledge, and considers all elements of the situation.

3) The Damage Control Assistant orders emergency repairs.

4) The Damage Control Assistant receives a report from the damaged area that flooding has now been confined to two compartments.

Match the following lettered terms to the four situations listed above.

a. Feedback

b. Stimulus

c. Organization

d. Response

---

4. Which represents the correct definition of adjustive behavior?

a. A person displays adjustive behavior when--as a consequence of responding to a particular stimulus--he effects a change in his environment.

b. A person displays adjustive behavior when--as a consequence of responding to a particular stimulus, thereby effecting a change in the environment which provides him with feedback--he modifies his future behavior.

c. None of the above

5. Which of the following provides a good definition of feedback? (There may be more than one correct choice.)

a. Any stimulus which provides knowledge of results

b. Any response which is a modification of previous behavior

c. Any stimulus which serves to inform an individual of the suitability of his output

d. Any stimulus which is an environmental condition

Now, check your answers on page 74.

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ANSWERS TO SUMMARY POST-QUIZ 3

1. a-5; b-1, 2, 3, 4
2. d
3. a-4, b-1, c-2, d-3
4. b
5. a, c

This is the end of Part Two, Segment II.

United States Naval Academy

INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PART TWO
INDIVIDUAL BEHAVIOR

Segment II
Behavior and Its Observation

Progress Check

WESTINGHOUSE LEARNING CORPORATION
Annapolis, Maryland
1971

BEHAVIOR AND ITS OBSERVATION

PROGRESS CHECK

Question 1.

As Officer-Of-The-Deck, in port, you have received a relay of instructions to "Send the Captain's gig to the Pierpoint Landing."

1) You wonder where the gig crew is at this moment.

2) Your stomach tenses momentarily as you anticipate an "angry" Captain waiting for his gig which does not show up.

3) You verbally give the order "Call away the gig."

4) You continue with your routine duties.

How should you classify the foregoing examples of behavior (affective, covert or overt)?

a. 1 and 2 (covert), 2 (affective), 3 and 4 (overt)
b. 1 and 4 (overt), 2 (covert), 1 and 2 (affective)
c. 3 and 4 (affective), 1 and 4 (overt), 2 (covert)
d. 3 and 4 (overt), 2 (covert), 1 and 2 (affective)

Question 2.

You have noticed over a period of time that you have a tendency to become drowsy during the class periods which immediately follow lunch. These classes are important so you decide to take notice of the amount and kind of food which you eat for lunch, and see if you are still drowsy if you exercise immediately after lunch. You inquire of your classmates to see if they experience the same difficulties. You compare your observations with their observations.

Which type of observation had you employed?

a. Natural

b. Casual

c. Introspective

d. None of the above

Question 3.

Which of the following correctly defines the term "independent variable"?

a. An independent variable is a condition which the experimenter alters in the hope of producing a change upon the dependent variable.

b. An independent variable is a condition which the experimenter wishes to change by the introduction and manipulation of the dependent variable.

c. An independent variable is a condition which the experimenter keeps constant throughout the experiment.

d. None of the above

Question 4.

Identify the four components of the experimental method as they are exemplified below.

1) A company commander wishes to improve performance in blinker drills of all midshipmen 4/c of his company.

2) He decides to see what effect the knocking off of Plebe rates during training period would have on performance.

3) He ascertains that each midshipman gets the same amount of time for drills and is given identical instructions.

4) He records the number of errors made at each practice session, and notes the midshipmen's final performance at the blinker drill competition. He compares this record with the record of Plebes at previous blinker drill competitions, and sees what improvement, if any, has taken place.

a. 1 dependent variable, 2 independent variable, 3 observation, 4 control

b. 1 independent variable, 2 dependent variable, 3 control, 4 observation

c. 1 dependent variable, 2 independent variable, 3 control, 4 observation

d. 1 observation, 2 control, 3 dependent variable, 4 independent variable

Question 5.

MIDN Able indicates to his officer representative that he would like to attend Sunday evening make-up period of instruction. However, he fails to show up for the class.

Which of the following would constitute a good operational definition of the midshipman's behavior?

a. The midshipman displays intention-performance congruency.

b. The midshipman displays positive-performance incongruency.

c. The midshipman displays intention-performance incongruency.

d. None of the above

Question 6.

Which one of the following best illustrates an "operational definition" of "hunger"?

a. A subject displays hunger if he eats when food is presented after a specified period of food deprivation.

b. Hunger is a condition of the human body when there is great appetite or need for food.

c. This is any condition of an organism where there is great desire such as a "hunger after truth and justice."

d. Hunger is a form of behavior which can be identified as a longing, hankering, wishing, yearning, craving or coveting.

Question 7.

Examine the following situations.

1) The group of migratory birds took flight and headed south for the winter.

2) The midshipman put aside his books, assembled his homework, undressed, and quickly fell asleep when he went to bed.

3) You anticipate a traffic signal change, prepare to slow down, change your mind and move out when you notice in the rear-view mirror that a car is following too closely.

4) The sunrise at sea caused the ship to cast long shadows and created miniature rainbow colors in the spray as it broke from the swells.

Which one of the foregoing situations best describes the interaction of stimulus, organization, response and consequent feedback?

a. 1

b. 2

c. 3

d. 4

Question 8.

1) A pilot who is commencing a landing sequence finds an "unsafe" landing gear down indication.

2) He elects to take the field arresting gear.

3) He drops his hook and informs the tower of what he intends to do.

4) The tower controller clears him to land.

Match the above steps with the elements listed below.

A. Feedback

B. Stimulus

C. Organization

D. Response

Which is the correct set of answers?

a. 4-A, 1-B, 2-C, 3-D

b. 3-A, 4-B, 1-C, 2-D

c. 1-A, 4-B, 2-C, 3-D

d. 2-A, 3-B, 4-C, 1-D

Question 9.

Identify the best operational definition of adjustive behavior.

a. A person displays adjustive behavior when he adjusts the demands made upon him by biological and social needs.

b. A person displays adjustive behavior when, after making a response to a particular stimulus, as a result of which a change in the environment occurs which provides feedback, he modifies his future actions.

c. A person displays adjustive behavior when he responds to a stimulus and thereby changes his environment.

d. A person displays adjustive behavior through organization.

Question 10.

Which one of the following is the best definition of a response?

a. Anything a person says or does: A reaction to environmental conditions.

b. Any behavior-eliciting condition in the environment.

c. That component of a system which signals deviation of the output from a defined condition.

d. The covert process by which we assimilate and structure sensory information.

PROGRESS CHECK ANSWER AND REMEDIATION FORM

PART Two SEGMENT II

REMEDIATION TEXT Syndactic Text - Vol - II-B

ITEM	ANSWER	REMEDIATION REFERENCE
1	a	Summary 1: Pages 1-3
2	a	Summary 1: Pages 3-5
3	a	Summary 1: Pages 5-7
4	c	Summary 2: Pages 29-30
5	c	Summary 2: Pages 32-34
6	a	Summary 2: Pages 32-34
7	c	Summary 3: Pages 55-58
8	a	Summary 3: Pages 55-58
9	b	Summary 3: Pages 55-56
10	a	Summary 3: Pages 55-57
11	☐	
12	☐	
13	☐	
14	☐	
15	☐	

United States Naval Academy

INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PART TWO
INDIVIDUAL BEHAVIOR

Segment III
Learning

Syndactic Text
Single Volume
(ST/SV)

WESTINGHOUSE LEARNING CORPORATION
Annapolis, Maryland
1971

FOREWORD

> *"Oh, this learning, what a thing it is."*
>
> *Shakespeare, The Taming of the Shrew*

The psychological concept of learning has a more universal meaning than the common notion of formal education. When psychologists attempt to explain learning, they refer to acquired motor or physical skills, trained emotional responses, habits and in some cases, passions, as well as the learning of the ABC's.

Theories of learning as advanced by individual schools are sometimes more reminiscent of the group of blind men trying to describe an elephant. One blind man touches the trunk and says, "This animal is like a large snake." Another blind man feels the elephant's leg and proclaims that an elephant is like a tree. And so on. In a sense they are all correct but only partially so, and to date, what we know about learning represents the tip of the iceberg for all that is represented by human learning.

But, if we were to scoff at all these theories or declare them inadequate, we would be like the man who, having heard the report of the blind men, decided that an elephant did not really exist. If what we know about learning doesn't tell the whole story, it does allow us to be more effective as leaders and trainers of men.

LEARNING

Summary 1

Defining, Describing, and Measuring Learning

How Heredity and Environment Affect Learning

Learning may be defined as any relatively permanent change in behavior which occurs as a result of experience or practice. This definition has three important elements: 1) Learning is a change in behavior, for better or worse. 2) It is a change that takes place through experience or practice; changes due to growth, maturation, or injury are not to be considered as learned. 3) The change, to merit the term learning, must be relatively permanent. This rules out changes due to motivation, fatigue, adaptation, or the sensitivity of the organism.[1]

According to definition, then, learning results from and depends upon contact with the environment. However, heredity plays an important part in learning as well. Heredity determines physical structure, i.e., long legs, big hands, which in turn biases an individual's behavior. For example, a man might have inherited the potential for becoming a good basketball player, (tall stature, long legs) but, nonetheless, requires certain environmental conditions, such as practice, good coaching, etc., in order to achieve that potential.

---

[1] Morgan and King, pp. 73, 74

Heredity is also responsible for differences between species, and hence, limits the kinds of behavior which a member of a given species is capable of learning. Finally, though it has not been conclusively proved, there is evidence to suggest that there is a direct relationship between a person's genetic makeup and his behavior. Inherited determiners, genes, affect the development of body tissues and organs which in turn affect the way a person behaves. In short, it is virtually impossible to say just where the influence of heredity leaves off, and where that of environment begins; but clearly, learning is the result of an interaction of both of these factors. More importantly, virtually all of man's behavior is learned, or affected by learning. Some important exceptions are instinctive and reflexive behavior.

Unlearned Behaviors--Instinct and Reflex

Besides those resulting from maturation (growth), the only clearly unlearned behaviors are instincts and reflexes. Instinctive behavior is typified by the baby bird, who flies immediately upon being pushed out of the nest. To qualify as instinctive, behavior must satisfy three requirements: 1) the behavior must be characteristic of the species (all baby birds can fly upon being thrown out of the nest); 2) it must appear full-blown at the first opportunity (the baby bird flies without any practice or training--learning); and 3) it must continue for some time in the absence of the stimuli which initially set it into motion (the bird continues to fly without again having to be pushed). Scientists disagree as to whether or not human beings exhibit instinctive behavior, but it is certainly apparent in the behavior of lower animals, i.e., maternal behavior of rats, migration of birds, etc.

A second type of purely unlearned behavior is, on the other hand, quite common in humans: that is, the reflex. A reflex is an inherited, automatic response to a certain stimulus. An example of reflexive behavior is the contraction of the pupil of the eye to the stimulus of light. No learning or practice is required in order for this behavior to occur, and the behavior ceases as soon as the stimulus is removed. It is in this final respect that reflexive behavior differs from instinctive, since instinctive behavior continues after the initiating stimulus has been removed.

Since so much of man's behavior is in fact learned, psychologists have devoted a great deal of study to learning, and ways of measuring and describing it.

Learning: Acquirement and Performance

Many factors, both learned and unlearned, affect performance. However, all that we can measure or study is the way an organism performs. Thus, in measuring learning, psychologists make an important distinction between acquirement and performance. Acquirement refers to the repertoire of behaviors (overt or covert) which the individual has acquired through previous learning or while in the process of learning. Performance refers to the valued outcome of what an individual has learned, in other words, the demonstration of acquirement.

For example, an enlisted man may be shown how to turn on an emergency valve by his superior. The enlisted man has acquired all the behaviors necessary for turning on the valve should an emergency occur, he has turned valves in other circumstances, and can describe what he would do in an emergency. However, until he actually does turn the valve in an emergency we cannot say he has demonstrated the acquired behavior through performance. In short, acquirement is the "accrual" or "getting" of new behavior, performance is the demonstration or valued outcome of the behavior.

Learning Curves

Although we cannot measure actual learning, we can assume that learning has occurred on the basis of improved performance. Patterns of learning may be plotted graphically and usually result in learning curves such as those illustrated in Figure 1 on page 5. The horizontal axis, or base line usually indicates units of practice, e.g., weeks of playing golf. The vertical axis represents degree of learning as indicated by some measure of performance, e.g., your golf score. Consider the degree of learning as the dependent variable, and the units of practice as the independent variable. The plotted line which results is the "learning curve." In Figure 1, curve A indicates a typical learning curve for some simple procedure, for example, simple knot tying. It shows rapid initial improvement, followed by decreasing gains from further practice. Curve B illustrates a typical learning curve for a more complex behavior, such as learning a language. It shows little or no improvement

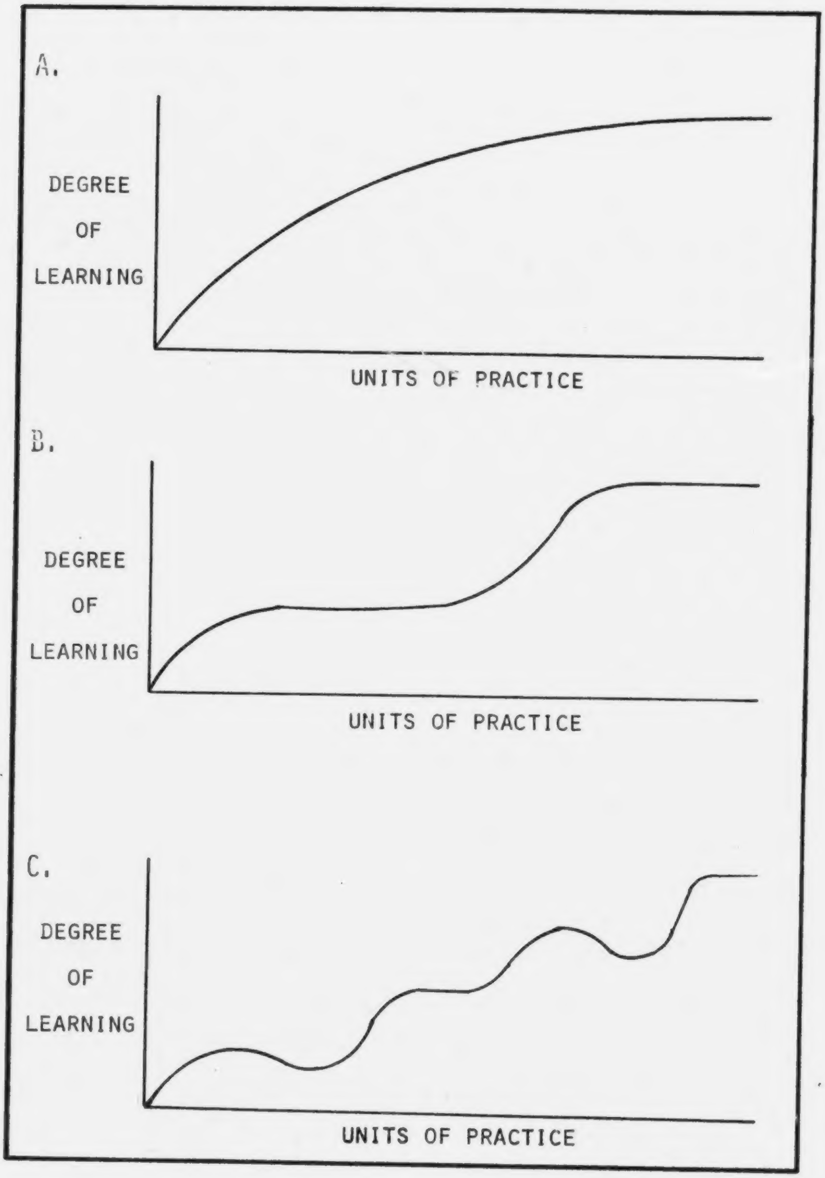


FIGURE 1. TYPICAL LEARNING CURVES

initially, followed by a period of rapid improvement, which is in turn followed by a period of little further improvement. Curve C illustrates the irregular nature of most learning curves, that is, how performance generally fluctuates during learning due to changes in motivation. Changes in motivation due to fear of failure, distraction, boredom, worry, etc., are reflected in the learning curve as plateaus, indicating periods of little or no improvement, or valleys indicating periods of decreased performance.

Kinds of Learning

There is some question among psychologists as to whether there is one process which we can call learning. There is no doubt, however, that there are different kinds of learning, and that different kinds of learning may occur simultaneously.

Conditioning

Soviet scientist Ivan Pavlov--is credited with first experimenting with and reporting on conditioning in 1927. While experimenting with apparatus to measure the rate of salivation in dogs, Pavlov accidentally discovered that the animals responded by salivating not only when food was placed in their mouths, but also when they were exposed to the smell of food. Eventually, these dogs learned to associate the experimenter with the stimulus of food--they began to salivate when he appeared--later, they salivated at the sound of his footsteps. Later, Pavlov introduced various artificial stimuli--bells--or lights--so that they became associated with the feedings. Once again, these dogs responded by salivating in response to the artificial stimuli alone, once the association had been established. The salivation of the dogs in response to stimuli other than food represents a conditioned response. And, the learning process which makes possible such behavior is known as conditioning. The conditioning process involves two types of stimuli: first, an unconditioned stimulus which is capable of calling forth a given response--in the Pavlov experiment this was the meat--and, second, an initially neutral stimulus--in the Pavlov experiment this was the ringing bell. Thus, conditioning is effected by pairing a neutral stimulus with an unconditioned stimulus. As a result of the pairing, an association is ultimately established which causes the previously neutral stimulus to elicit the same response as the unconditioned stimulus. Pavlov's experiments were examples of classical conditioning. In classical conditioning the paired stimuli are presented in a controlled manner so that they are independent of anything the subject himself does. There are other kinds of conditioning besides classical conditioning. Laboratory experiments have demonstrated conditioning in which the subject makes an accidental discovery of the conditioned response that produces the unconditioned stimulus. This kind of experiment produces instrumental or operant conditioning. Here is an example.

In one experiment a pigeon is placed in a box which has a number of keys positioned around the wall. The keys are inoperative except for one key. If the pigeon pecks this one key, it causes a pellet of pigeon feed to be released. After the pigeon pecks the proper key and receives food each time, he becomes conditioned. Subsequently, whenever the pigeon wishes to eat, he then selects and pecks only the food key. Here, the food is the unconditioned stimulus. The food is paired with the key--the neutral stimulus--to produce the conditioned response--the pecking of the key. Notice how the unconditioned stimulus in each of the examples we presented--in classical and operant conditioning--can function as a "reward"--or as positive reinforcement.

Discrimination

Let's use the conditioning example to illustrate another kind of learning--discrimination. To discriminate is to distinguish between two or more different stimuli--or between stimulus and no stimulus. We define "distinguish between" as: "make different responses to." Therefore, you can say that discrimination has been demonstrated when an individual responds differently to different stimuli. The pigeon in the experimental box learned to discriminate between the keys and demonstrated this by pecking only the food key when he was hungry.

Motor Skill Learning

Another kind of learning is typified by the process of learning to ride a bicycle. This requires motor skill, that is, behavior involving muscle activity. Marksmanship, golf, walking, knot-tying, and so forth, are all examples of learning which involve motor skills...they call for some degree of muscle development and coordination.

Verbal Learning

Verbal learning is any learning that has to do primarily with words. When an instructor at the Academy asks a midshipman to define a term he has studied, the midshipman responds with a definition, indicating by his performance whether or not verbal learning has taken place.

Mixed Learning

As you can well imagine, it would be most unusual for any one type of learning to occur in isolation. It is far more typical for *mixed learning* to take place, that is, for more than one kind of learning to occur at the same time. For example, discrimination may involve both motor skill learning and verbal learning, and frequently involves both.

Attitude Learning

Attitude learning is the development, often through conditioning, of learned, emotionalized *predispositions*--you respond, in some consistent way, to people--things--or situations. Attitude learning is responsible for tendencies--toward prejudice or tolerance--toward selfishness or generosity--toward cynicism or loyalty--etc.

Problem-Solving

This is learning in which already learned principles are applied in a new way in order to solve some problem.

This is the end of Summary 1. Now take Summary Pre-Quiz 1 on the next page.

Summary Pre-Quiz 1

Defining, Describing, and Measuring Learning

Answer the following questions as indicated in your Student Guide.

1. Select from the numbered examples the best illustration of performance indicating a) verbal learning, and b) motor skill learning.

a. Verbal

b. Motor skill

1) Naval ships always have identifying names.

2) MIDN White is asking a native directions in Spanish.

3) A midshipman salutes his superior.

4) An officer tells an enlisted man how to perform a certain task.

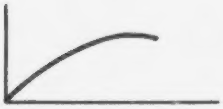
2. Match each one of the lettered items with the description which best applies. (Use each description only once).

a. Learning curve

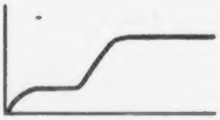
b. Base line in a learning performance graph

c. Vertical axis in a learning performance graph

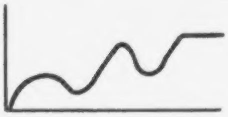
d.



e.



f.



1) Performance of slight initial learning followed by rapid learning

2) Index of performance, such as score in points or the percentage correct

3) Indication of rapid initial learning, followed by a decrease in rate of improvement through practice

4) Learning interrupted by periods of no gain, or temporary loss of skills

5) Independent variable, that is number of trials, time spent in practice

6) Graphic representation of rate of learning as measured by performance

3. Which of the following examples properly describe discrimination learning? (There may be more than one correct answer to this question.)

a. A midshipman receives "A's" for completing assigned homework and "F's" for failing to complete homework, avoids completing homework and wonders why he doesn't get "A's."

b. A junior officer learns to respond differently to several different signal hoists.

c. You instruct the security guard at the Naval Station to admit only cars with proper stickers and stop all other cars for identification. He carries out the instructions.

d. A midshipman makes the same response when he is exposed to two different kinds of stimuli.

---

4. How can you differentiate between acquirement and performance?

a. Acquirement is patterned behavior and performance is how you will do a job.

b. Acquirement is the accrual of new behaviors and performance is the demonstration of learning.

c. Acquirement is the set of behaviors learned through a demonstration of performance.

d. Acquirement is the amount of money you are paid, based on your performance of duties.

---

5. Which best states the roles of heredity and environment in determining behavior?

a. Behavior is primarily determined by heredity.

b. Behavior is primarily determined by environment.

c. Heredity and environment independently affect behavior.

d. Heredity and environment interact in determining behavior.

6. Which example best typifies instinctive behavior?

   a. A sailor automatically takes cover in combat as he hears the sound of a shell passing overhead.

   b. Young birds build a typical nest for that species when they are mated for the first time.

   c. The hound dog appeared to be able to tell time because he was present precisely at mealtimes.

   d. The Boatswain Mate of the Watch invariably seemed to know who was trying to bring aboard liquor.

---

7. Which of the following best exemplifies conditioning?

   a. A yellow light flashes whenever a picture of a cat appears on a screen to stimulate a student to write "cat." Soon the student learns to write "cat" every time only the yellow light flashes.

   b. A mother rat builds a complex nest of hay and feathers when she is about to give birth for the first time.

   c. A person's leg flexes when the kneecap is hit sharply with a mallet.

Now, check your answers on page 16.

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ANSWERS TO SUMMARY PRE-QUIZ 1

1. a-2, b-3
2. a-6, b-5, c-2, d-3, e-1, f-4
3. b, c
4. b
5. d
6. b
7. a

If all your answers are correct go to Summary 2 on page 35. If you missed one or more questions go through Programed Sequence 1 on the next page.

Programed Sequence 1

Defining, Describing, and Measuring Learning

1 Learning is any relatively permanent change in behavior which occurs as the result of experience or practice. Note that this definition has three important elements. 1) Learning is any change in behavior, for better or worse, 2) It is a change that takes place through experience or practice, changes due to growth, maturation, or injury do not fit this category, 3) The change must be relatively permanent. This rules out changes due to motivation, fatigue, adaptation, or the sensitivity of the organism.[1]

Which of the following statements about learning is not true?

a. Learning is the result of interaction with the environment, i.e., practice or experience.

b. Learning is a relatively permanent change in behavior.

c. Learning refers only to any improvement in behavior.

d. Learning may be either improvement or a decline in behavior.

---

[1] Morgan and King, pp. 73, 74

$\boxed{2}$ Learning results from and depends upon contact with the environment. Heredity, however does play a part in learning, as it is heredity which determines physical structure, which in turn, biases behavior. For example, a man might have inherited the potential for becoming a good track star (tall stature, long legs) but, unless he is exposed to certain environmental conditions (practice, encouragement, good coaching, competition) he will not achieve that potential. Conversely, a man with less inherited potential (shorter stature, short legs) might, if exposed to the above mentioned environment, become an outstanding track star.

Heredity, then, influences learning in which of the following ways?

a. It determines the kind of environment in which an individual will develop or not develop his potential.

b. It determines the physical structure of the individual, which in turn influences his behavior, i.e., makes it more likely that he will learn some things, and not learn other things.

3 Heredity is responsible for differences between species, and hence limits the kinds of behavior which a member of a given species is capable of learning. Finally, inherited determiners, genes, affect the development of each individual's body tissues and organs which in turn affect the way he behaves. In short, it is virtually impossible to say just where the influence of heredity leaves off, and where that of environment begins.

How might we best summarize the effects of heredity and environment upon learning?

a. Heredity and environment both interact in learning.

b. Learning is largely due to environmental influences, and reflects little influence of heredity.

---

4 Virtually all of man's behavior is learned. There are, however, some important exceptions. Besides those changes resulting from maturation (growth) the only clearly inherited behaviors, i.e., which do not require learning, are instincts and reflexes. To qualify as instinctive, behavior must satisfy three requirements: 1) the behavior must be characteristic of the species (all baby birds can fly upon being thrown out of the nest); 2) it must appear full blown at the first opportunity (the baby bird flies without any practice or training--learning); and 3) it must continue for some time in the absence of the stimuli which initially set it into motion (the bird continues to fly without again having to be pushed).

Which of the following is not one of the prerequisites for instinctive behavior?

a. It must be characteristic of the entire species.

b. It must continue for some time in the absence of the stimuli which initially set it in motion.

c. It must appear full blown at the very first opportunity.

d. It must be preceded by practice or training.

5 Match each prerequisite for instinctive behavior with the appropriate example.

a. Characteristic of the species

b. Appears full blown at the first opportunity

c. Continues for some time in the absence of stimuli which initiated it

1) The mother rat builds a complex nest of hay and feathers for her young

2) All mother rats exhibit the same type of maternal behavior

3) After the young are born, the mother cares for the young for a considerable length of time

---

6 Based on the criteria you have just learned, which of the following is an example of instinctive behavior?

a. The migration of birds south for the winter

b. The gift of perfect pitch

c. An infantryman throws himself to the ground at the sound of gunfire.

---

7 We said before that there are two types of inherited, unlearned behavior. The first is instinctive behavior, and the second is reflexive behavior. A reflex is an inherited automatic response to a certain stimulus. Reflexive behavior differs from instinctive in that it ceases as soon as the initiating stimulus is removed. An example of reflexive behavior is the contraction of the pupil of the eye when exposed to bright light. When the light is removed, the pupil returns to its former state.

The automatic muscular contraction that results when the kneecap is hit lightly with a mallet is an example of which kind of behavior?

a. Instinctive

b. Reflexive

8 Choose the statement which best compares instinctive and reflexive behavior.

a. Instinctive is an inherited pattern of behavior which is common to a species, appears full blown at the first opportunity and continues for some time thereafter. Reflexive behavior, on the other hand, though inherited, and common to a species, appears only in response to a stimulus, and ceases as soon as the stimulus is withdrawn.

b. Instinctive and reflexive behaviors are essentially the same. Both are inherited, shared by all members of the species, and appear full blown at the first opportunity, continuing for some time thereafter.

---

9 Since so much of man's behavior is in fact learned, psychologists have devoted a great deal of study to learning and ways of measuring and describing it. Since learning itself is a covert process, all that can be measured is performance, i.e., how the individual behaves. From performance we can judge whether or not learning has taken place.

Which of the following best defines performance?

a. It is the covert unmeasurable process by which learning takes place.

b. It is the overt measurable process by which we judge whether or not learning has taken place.

10 Psychologists make a distinction between performance and acquirement. Acquirement refers to the repertoire of behaviors which an individual has acquired through previous learning, or while in the process of learning.. For example, we might assume that a midshipman has acquired from previous learning the skills necessary for ship navigation, i.e., ability to read and follow directions, knowledge of measurement, motor skills needed for taking star sights, etc. However, until he demonstrates through performance, i.e., actually navigates, we cannot scientifically say "he has learned how to navigate a ship."

Match each term with the appropriate description.

a. Performance
b. Acquirement

1) Automatic response to certain stimuli
2) Demonstration of valued outcome of behavior
3) Accumulation of behaviors

11 We cannot measure actual learning, but we can assume that learning has taken place judging on the basis of improved performance. Patterns of learning progress may be plotted graphically and usually result in configurations such as those shown in Figure 1, known as learning curves.

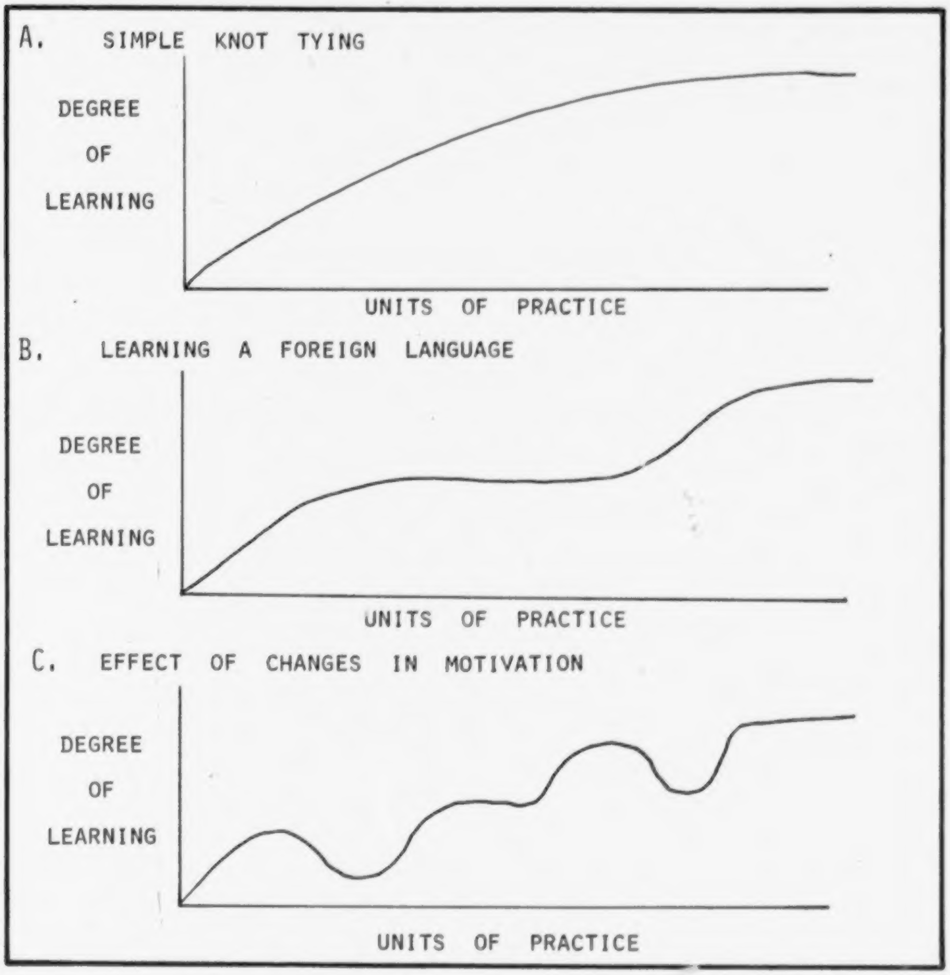


FIGURE 1. TYPICAL LEARNING CURVES

12 The horizontal axis, or base line on the graph indicates units of practice, e.g., attempts to tie a bowline. The vertical axis represents degree of learning as indicated by some measure of performance. In the knot-typing example, this might be which of the following?

a. Number of successfully tied bowlines

b. Number of attempts before successfully tying a bowline

---

13 Learning curve A would be interpreted in which of the following ways?

a. It shows rapid initial improvement followed by decreasing gains from further practice.

b. It shows initially little improvement, then rapidly increasing gains from further practice.

---

14 Curve B indicates a typical learning curve for some complex task such as learning a foreign language.

Which of the following interprets it correctly?

a. It shows little or no improvement initially, followed by a decrease in performance with further practice.

b. It shows little or no improvement initially, followed by a period of rapid improvement, which is in turn followed by a period of little further improvement.

15 Curve C illustrates the irregular nature of most learning curves. The irregularity is caused by changes in motivation. Fear of failure, distraction, boredom, worry, etc., may all influence motivation, causing periods of little or no improvement (plateaus in the learning curve) or periods of actual decreased performance (valleys in the learning curve).

Match the following:

a. Valley in learning curve indicates:	1) Period of increased performance
b. Plateau in learning curve indicates:	2) Period of decreased performance
	3) Period of little or no improvement

16 There is some question among psychologists as to whether there is one process which we can call learning. There is no doubt, however, that there are different kinds of learning, and that different kinds of learning may occur simultaneously.

Which of the following is true?

a. There are several different kinds of learning, but only one kind of learning may take place at a given time.

b. There are several different kinds of learning, and often different kinds of learning may take place simultaneously.

17 Conditioning is the first kind of learning we shall discuss. It was first described and reported by Soviet Scientist Ivan Pavlov in 1927. Pavlov, while experimenting with apparatus to measure the rate of salivation in dogs, accidentally discovered that the animals responded by salivating not only when food was placed in their mouths, but also when they were exposed to the smell of food. Pavlov experimentally introduced various artificial stimuli--bells--or lights--so that they became associated with the feedings. Once again, these dogs responded by salivating in response to the artificial stimuli alone, once the association had been established.

From the above discussion, you might conclude that conditioning involves which of the following?

a. Isolation of stimuli

b. Association of stimuli

18 In Pavlov's experiment the dog's response (salivation) to a stimulus other than food is a conditioned response or, a response learned through conditioning. The conditioning process involves two types of stimuli: First, an unconditioned stimulus--one which is capable of eliciting certain behavior. In Pavlov's experiment this was the meat. Second, another, neutral stimulus is paired with the unconditioned stimulus until it, alone, can elicit the original response. The second stimulus is the conditioned stimulus.

Select from the following the statement which best describes conditioning.

a. Form of learning in which subject learns to respond in a different way to similar stimuli. The two distinct responses are known as conditioned responses.

b. Form of learning in which subject learns to respond to a neutral (conditioned) stimulus in the same way that he formerly responded only to another stimulus (unconditioned).

---

19 A second kind of learning in which the subject learns to distinguish between two or more stimuli which differ in some detail--or between stimulus and no stimulus--is known as discrimination learning.

Choose the two examples of discrimination learning.

a. A pigeon learns to peck at the red key and not the blue, yellow or green one.

b. A doorman learns to admit to a certain club only those persons possessing I.D. cards.

c. A rat learns to press a bar not only when he is shown a picture of a cat, but also when he hears the recorded sound of a cat's meow.

20 The kind of learning which primarily involves distinguishing between stimuli or between presence of and absence of stimulus, is known as which of the following?

a. Differentiation
b. Conditioning
c. Discrimination
d. None of the above

---

21 Another kind of learning is motor skill learning. This is any kind of learning which involves muscle activity.

Which of the following is the best example of motor skill learning?

a. Learning to read
b. Learning to write

---

22 Verbal learning is any kind of learning which has to do primarily with words.

A plebe, when he first arrives, must learn the special vocabulary of terms used at the Academy.

This is an example of primarily which kind of learning?

a. Discrimination
b. Conditioning
c. Verbal
d. Motor skill

23 As you have probably surmised, it is rare for only one kind of learning to take place at a given time. It is far more typical for mixed learning to take place.

For example, the plebe learns not only the meaning of those special terms associated with the Academy, but also learns to respond to commands in which they are used. Thus, he has undergone both verbal and motor skill learning or:

a. Conditioning

b. Mixed learning

---

24 Another kind of learning is attitude learning. This is the development, often through conditioning, of emotionalized predispositions--tendencies to respond in some consistent way to people, things, or situations.

Prejudices are usually the result of: (Choose one)

a. Motor skill learning

b. Mixed learning

c. Attitude learning

---

25 The final kind of learning we shall discuss is problem solving. Here, already learned principles are applied in a new way to solve some problem.

Which of the following is an example of problem solving learning?

a. Knot-tying

b. Balancing a chemistry equation

This is the end of Programed Sequence 1. Now, go to the next page and take the Quiz.

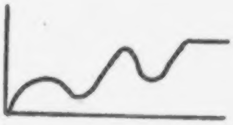
Summary Post-Quiz 1

Defining, Describing, and Measuring Learning

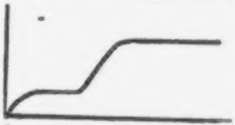
Answer the following questions as indicated in your Student Guide.

1. Match each one of the lettered items with description which best applies. (Use each description only once.)

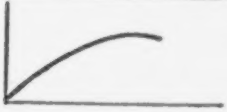
a.



b.



c.



d. Vertical axis in a learning performance graph

e. Base line in a learning performance graph

f. Learning curve

1) Performance of slight initial learning followed by rapid learning

2) Index of performance, such as score in points or the percentage correct

3) Indication of rapid initial learning, followed by a decrease in rate of improvement through practice

4) Learning interrupted by periods of no gain, or temporary loss of skills

5) Independent variable, that is number of trials, time spent in practice

6) Graphic representation of rate of learning as measured by performance

2. Select from the numbered examples the best illustration of performance indicating a) motor skill, and b) verbal learning.

a. Motor skill

b. Verbal

1) Naval ships always have identifying names.

2) MIDN White is asking a native directions in Spanish.

3) A midshipman salutes his superior.

4) An officer tells an enlisted man how to perform a certain task.

---

3. Which of the following examples properly describe discrimination learning? (There may be more than one correct answer to this question.)

a. A junior officer learns to respond differently to several different signal hoists.

b. You instruct the security guard at the Naval Station to admit only cars with proper stickers and stop all other cars for identification. He carries out the instructions.

c. A midshipman makes the same response when he is exposed to two different kinds of stimuli.

d. A midshipman receives "A's" for completing assigned homework and "F's" for failing to complete homework, avoids completing homework and wonders why he doesn't get "A's."

4. Which best states the roles of heredity and environment in determining behavior?

a. Heredity and environment independently affect behavior.

b. Heredity and environment interact in determining behavior.

c. Behavior is primarily determined by environment.

d. Behavior is primarily determined by heredity.

5. How can you differentiate between acquirement and performance?

a. Acquirement is the set of behaviors learned through a demonstration of performance.

b. Acquirement is the amount of money you are paid, based on your performance of duties.

c. Acquirement is the accrual of new behaviors and performance is the demonstration of learning.

d. Acquirement is patterned behavior and performance is how you will do a job.

6. Which example best typifies instinctive behavior?

a. Young birds build a typical nest for that species when they are mated for the first time.

b. A sailor automatically takes cover in combat as he hears the sound of a shell passing overhead.

c. The Boatswain Mate of the Watch invariably seemed to know who was trying to bring aboard liquor.

d. The hound dog appeared to be able to tell time because he was present precisely at mealtimes.

7. Which of the following best exemplifies conditioning?

   a. A yellow light flashes whenever a picture of a cat appears on a screen to stimulate a student to write "cat." Soon the student learns to write "cat" every time only the yellow light flashes.

   b. A mother rat builds a complex nest of hay and feathers when she is about to give birth for the first time.

   c. A person's leg flexes when the kneecap is hit sharply with a mallet.

Now, check your answers on the next page.

ANSWERS TO SUMMARY POST-QUIZ 1

1. a-4, b-1, c-3, d-2, e-5, f-6
2. a-3, b-2
3. a, b
4. b
5. c
6. a
7. a

Now, go to the next page and go through Summary 2.

Summary 2

Concepts and Operations in Controlling Behavior

Achieving Stimulus Control

When an individual responds in a certain way to a given stimulus, that stimulus can be said to control his behavior. Research in learning has pointed out the need for and the importance of maintaining stimulus control if one wishes to change behavior or to teach new behavior. As a leader you will be required to modify, manipulate, and control your subordinates' behavior.

The following are the steps usually followed in achieving stimulus control:

1) Determine the specific behavior or change in behavior you wish to bring about
2) Identify the stimuli (stimulus) which presently control(s) or might control the target behavior
3) Arrange the stimulus conditions which will result in the desired response
4) Provide reinforcement for the desired response

Reinforcement

Step 4 in the stimulus control process is especially important. After managing stimulus conditions to produce the desired response, the leader or teacher should provide consequences which will increase the likelihood that the desired response will be made again. This provision of consequences for behavior is known as reinforcement. Reinforcement may be positive or negative.

By definition, positive reinforcement is that consequent event which by its occurrence increases the probability of the response it is contingent upon. Positive reinforcement might consist of a reward, recognition, knowledge of results (feedback), or simply the opportunity to continue some satisfying behavior.

Negative reinforcement increases the probability of a desired response by terminating some contingent aversive stimulus. For example, jail may act as negative reinforcement. Good behavior may cause the termination of the aversive stimulus--imprisonment.

Reinforcement must be timely to be effective. It should be provided as soon as is practical after the response has been made. This means that the awarding of a Medal of Honor 8 months after an heroic act was performed might be considered as timely as the pronouncement of "well done" immediately after an ordinary task had been well carried out.

Shaping Behavior

The process of successively reinforcing closer and closer approximations of the correct response is called shaping. The instructor on the rifle range is using shaping when he provides reinforcement to the beginning student, even though he just barely manages to hit the target. Later, when the student has had more practice, the instructor reinforces only those hits which are on or near the bull's-eye. Finally, he reinforces only those shots which are on the bull's-eye. By administering and withholding reinforcement according to successive approximations, the instructor shaped the desired behavior.

Schedules of Reinforcement

In shaping marksmanship behavior, the rifle range instructor varied the schedule of reinforcement. He provided a continuous reinforcement schedule in the beginning of training. Then, he switched to an intermittent reinforcement schedule after he decided that continuous reinforcement was no longer necessary or advisable. Continuous reinforcement simply means that reinforcement is provided every time the desired response is made. Learning is most effective during the initial phase if continuous reinforcement is provided.

After the desired pattern of behavior has been established the intermittent reinforcement schedule may suffice to occasionally reinforce acceptable behavior when performance lapses slightly.

Research shows that behavior shaped using an intermittent reinforcement schedule is particularly resistant to extinction, in other words, less likely to disappear once reinforcement ceases.

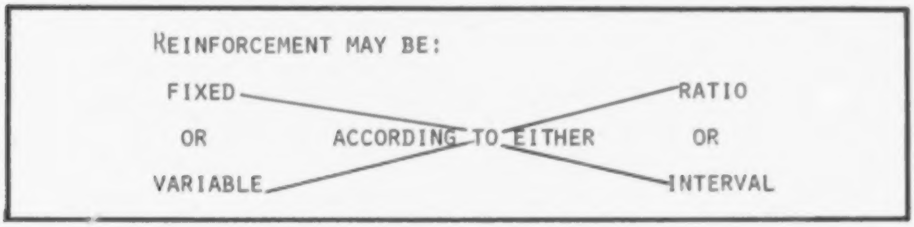


FIGURE 2.

Figure 2 shows a number of different ways in which reinforcement may be scheduled. First, reinforcement may be administered according to the number of responses, that is, in a certain ratio to the number of performances. A catapult officer who gives the crew a smoke break after every 20 launchings provides reinforcement according to a fixed ratio: i.e., one reinforcement per 20 launchings. Reinforcement may also be administered according to a variable ratio, for example, in the way a slot machine is programed to pay off after a varying number of plays, perhaps two, perhaps seven, or thirteen plays.

Secondly, reinforcement may be scheduled according to intervals of time, not number of performances. Fixed interval reinforcement would then be the administering of reinforcement after certain fixed time periods, e.g., every two weeks. This is exemplified by the instructor who gives a test each two weeks, the reinforcement in this case being the feedback (knowledge of results) which the students may use to evaluate their progress. Finally, reinforcement may be administered on a variable interval schedule. This is typified by the fixed number of required inspections which an assigned officer must conduct each month. The amount of time between such inspections is usually variable, unpredictable. Clearly, the kind of behavior being shaped, the previous training and personalities of the subjects, the situations under which shaping is taking place, are all factors which help determine the reinforcement schedule most appropriate for a given situation.

Eliminating Unwanted Behavior

We have discussed ways of increasing the likelihood that a subordinate will make the responses you wish him to make. A leader frequently encounters problems of the opposite nature. This leader may wish to suppress or eliminate undesirable behavior.

Extinction

Psychologists define extinction as the elimination of a response from an individual's repertoire through the withholding of all positive consequences for that response.

One way to extinguish an undesired response is to withhold positive reinforcement for that response. A response will ultimately disappear if all positive reinforcement for a response is eliminated. It is important that the reinforcement be eliminated entirely. Individuals resist extinction of any learned behavior. You probably have experienced or observed a build-up of resistance in situations where the behavior has been reinforced intermittently. Thus, occasional lapses in withholding of reinforcement actually produce a variable reinforcement schedule--making extinction even more difficult than it was before the extinction effort began.

Another way to extinguish unwanted behavior is to reinforce incompatible behavior. This must be done simultaneously with the withholding of reinforcement. For example, supposing a member of the catapult crew were slacking off, yet receiving reinforcement of a smoke break along with all the other members of the crew. You could withhold his reinforcement by giving him some chore to do while the others were taking a smoke break, and at the same time make a point of praising him on the rare occasions when he appears to be working hard. You would thus reinforce a behavior (working hard) which is incompatible with the undesired behavior (slacking off).

Punishment

Punishment consists of presenting an aversive stimulus following an unwanted response. Punishment is presented for the purpose of decreasing the likelihood of the response being repeated. Aversive events used in the punishment process are known as punishers. Punishers are any circumstances which are painful, threatening, frightening, disturbing, uncomfortable, or boring; for example, extra duties, loss of pay, withholding of liberty, confinement, reprimands.

Punishment causes a decreased probability of an undesired response through presentation of an aversive event following the response. Use of punishment as a single means of controlling behavior has a shortcoming. It tends to suppress the unwanted behavior only as long as the threat of punishment persists. As soon as the threat is removed, the former behavior patterns usually tend to recur.

Punishment can be useful in eliminating undesired behavior if it is used in conjunction with other operations--such as extinction of undesired responses--or--conditioning of alternative, desired responses.

Presentation of punishment can also be used as a signal to the individual that he has made an undesired response. Once he understands this, he can better change his response to the desired one--provided, of course, that he knows what the desired response may be.

This is the end of Summary 2. Now take Summary Pre-Quiz 2 on the next page.

Summary Pre-Quiz 2

Concepts and Operations in Controlling Behavior

Answer the following questions as indicated in your Student Guide.

---

1. Which one of the following best describes "reinforcement?"

    a. An event which increases the probability of that response, if made a condition of that response

    b. A consequence of our response which is of value to us

    c. A consequence of a stimulus which extinguishes our tendency to respond

---

2. A midshipman spends the entire first semester at the Academy studying French for the first time. He has learned the meaning and use of the words, but has not been able to correctly pronounce them. Therefore, he is always self-conscious about his oral performance in class.

Which one of the following procedures should be used by the instructor to eliminate the midshipman's problem?

a. The instructor should not correct the midshipman's mispronunciation, but should wait until his pronunciation is good before giving him any grade above "C."

b. The instructor should be critical of the midshipman whenever he makes an error in pronunciation, but give him "A's" anyway.

c. The instructor should praise the midshipman for each successively better attempt at prounciation, raising his standards as the midshipman improves.

d. The instructor should praise the midshipman only after he pronounces each word correctly, three times in a row, since only then would the midshipman be doing "A" work.

3. Match each of the steps in stimulus control with the appropriate numbered activity.

- a. Identify the stimuli which currently control the behavior.
- b. Determine the components of the desired response.
- c. Arrange the stimulus conditions which will result in the desired response.
- d. Reinforce the behavior.

1) The instructor has noticed that improvement has occurred in the past when additional homework was required and when graded papers were returned to the students, and the improved students were rewarded with lighter homework assignments.

2) An instructor at the Academy is dissatisfied with the performance of a certain class on homework papers. He has consistently assigned homework, but never given grades on it or handed back the papers.

3) The instructor announces the criteria for a good paper, and states that the graded papers will be returned and that students who exceed the standards will be rewarded with lightened homework assignments and that those who fail to meet the standard will be required to continue doing the increased homework.

4) The instructor recognizes superior achievement in the manner described.

4. In which one of the following examples does the squad leader employ the principle of reinforcing incompatible behavior during extinction to achieve a change in the behavior of a fourthclassman?

a. In addition to intermittent verbal reprimands, the squad leader offers "carry-on" at the table to the fourthclassman whenever he does appear properly dressed at formations.

b. The squad leader increases the frequency and intensity of the verbal reprimands and combines them with more severe disciplinary action.

c. Since he is getting no results anyway, the squad leader ceases entirely giving verbal reprimands for this uncooperative underclassman.

d. The squad leader should discipline all of the fourthclassmen in that squad so that they will force the offender to come to formations in the proper uniform.

---

5. Match each type of reinforcement schedule with the appropriate example.

a. Fixed interval

b. Fixed ratio

c. Variable interval

d. Variable ratio

1) A Commanding Officer praises his men every second time that they do well.

2) A midshipman in training is told "good" by his instructor after a random number of accurate rifle "hits" on the target.

3) Paychecks are distributed to all midshipmen on the last day of each month.

4) A certain instructor at the Academy was known to administer several unannounced "spot" quizzes per semester to make sure that the midshipmen studied on a regular basis.

6. Which of the following best describes extinction?

   a. Reinforcement of behavior which is the exact opposite of the desired behavior

   b. The elimination of a response from an individual's repertoire through the withholding of all positive consequences for that response

   c. The elimination of behavior through the consistent presentation of negative consequences for that response

   d. Suppression of behavior whose occurrence prevents the occurrence of the desired behavior

Now, check your answers on page 46.

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ANSWERS TO SUMMARY PRE-QUIZ 2

1. a
2. c
3. a-2, b-1, c-3, d-4
4. a
5, a-3, b-1, c-4, d-2
6. b

If all your answers are correct, you have finished this segment. If you missed one or more questions, go to the next page and go through through Programed Sequence 2.

Programed Sequence 2

Concepts and Operations in Controlling Behavior

1 When an individual responds in a certain way to a given stimulus, that stimulus can be said to control his behavior. Learning research has pointed up the importance of maintaining stimulus control if one wishes to change or teach new behavior.

Since a leader will be required to modify, manipulate, and control his subordinates' behavior, it follows that: (choose one).

a. He should have no need for a knowledge of the principles of stimulus control.

b. He should be familiar with and make use of the principles of stimulus control.

2 The following are the steps usually followed in achieving stimulus control:

1) Determine the specific behavior or change in behavior you wish to bring about.

2) Identify the stimuli(stimulus) which presently control(s) or might control the target behavior.

3) Arrange the stimulus conditions which will result in the desired response.

4) Provide reinforcement for the desired response

Which is the first step in the stimulus control process?

a. Identify the stimulus(stimuli) which presently control(s) behavior.

b. Determine the specific behavior or change you wish to bring about

c. Provide reinforcement for the desired response.

d. Arrange the stimulus conditions which will result in the desired response.

3 The second step is to identify the stimulus(stimuli) which presently control the target behavior.

Match each step with the correct description.

1) Step one

2) Step two

a. Arrange stimulus conditions to achieve desired response

b. Identify stimulus(i) presently controlling behavior

c. Determined specific change in behavior you wish to bring about

---

4 The third and fourth steps toward achieving stimulus control are 3) to arrange or manage stimulus conditions which will result in the desired response and 4) provide reinforcement for the desired response.

A physical education instructor wishes to improve the performance of his students on the parallel bars. He has noticed that students with experience in rope climbing have performed better on the bars than those without. He subsequently schedules parallel bar work after rope climbing in his course schedule. He also establishes a special award for those achieving a certain standard in parallel bar work.

Has the instructor carried out all the steps in the stimulus control process?

a. Yes

b. No

5 Reinforcement may be positive, i.e., any consequent event which by its occurrence increases the probability of a desired response. Positive reinforcement might be a reward, recognition, or simply the chance to continue some satisfying behavior. Reinforcement may be negative as well. Negative reinforcement increases the probability of a desired response by terminating some aversive stimulus. Jail may act as a negative reinforcer in that good behavior may cause the termination of an aversive stimulus--imprisonment.

Reinforcement must be timely to be effective. It should be provided as soon as possible after the response has been made.

Awarding a Medal of Honor 8 months after an heroic act and pronouncing a "well done" immediately after a seaman has done a job particularly well are both examples of: (Choose one.)

a. Timely reinforcement--most effective

b. Untimely reinforcement--not so effective

6 The process of successively reinforcing closer and closer approximations of the correct response is called shaping.

The instructor on the rifle range is using shaping when he provides reinforcement to the beginning student, even though he just barely manages to hit the target. Later, when the student has had more practice, the instructor reinforces only those hits which are on or near the bull's-eye. Finally, he reinforces only those shots which are on the bull's-eye. By administering and withholding reinforcement according to successive approximations, the instructor shaped the desired behavior.

Which of the following defines shaping?

a. The withholding of all positive reinforcement until the desired behavior has been reached by successive approximation.

b. The frequent reinforcement of approximation to the desired response to bring them closer to the desired response.

7

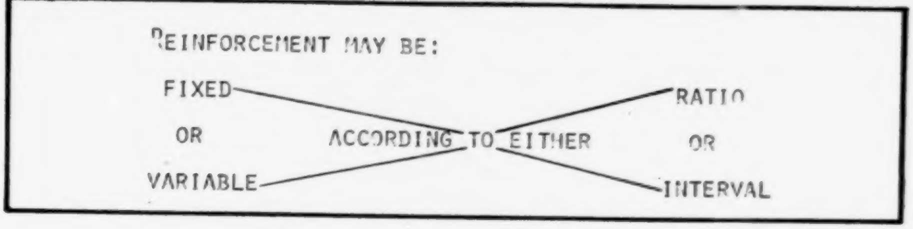

FIGURE 2.

Figure 2 shows a number of different ways in which reinforcement may be scheduled. First, reinforcement may be administered according to the number of responses, that is, in a certain ratio to the number of performances. A catapult officer who gives the crew a smoke break after every 20 launchings provides reinforcement according to a: (Choose one)

a. Variable ratio

b. Variable interval

c. Fixed ratio

d. Fixed interval

---

8 Reinforcement may also be administered according to a variable ratio, that is, after a varying number of performances.

Which exemplifies a variable schedule of reinforcement?

a. A slot machine which is programed to pay off after first two, then seven, then thirteen plays.

b. A teacher who compliments a student every time he recites in class.

c. Both of the above

d. None of the above

9 Secondly, reinforcement may be scheduled according to intervals of time, not number of performances. Fixed interval reinforcement would then be the administering of reinforcement after certain fixed time periods, e.g., every two weeks. This is exemplified by the instructor who gives a test each two weeks, the reinforcement in this case being the feedback (knowledge of results) which the students may use to evaluate their progress. Finally, reinforcement may be administered on a variable interval schedule.

The variable interval schedule is exemplified by which of the following?

a. A midshipman compliments his drag every time she wears his favorite dress.

b. An assigned officer conducts a specified number of inspections at random intervals during a given month.

---

10 The situation, the group, and the personality of the leader all interact to help determine which schedule of reinforcement is most appropriate. However, the variable ratio schedule has been proved to maintain performance at a high peak.

Praising a catapult crew on a random basis for their consistently high performance is likely to : (Choose one)

a. Cause a decrease in performance

b. Make performance increase

c. Maintain a consistently high level of performance.

11 We have discussed ways of increasing the likelihood that a subordinate will make the responses you wish him to make. A leader frequently encounters problems of the opposite nature. This leader may wish to suppress or eliminate undesirable behavior.

Psychologists define extinction as the elimination of a response from an individual's repertoire through the withholding of all positive consequences for that response.

Which of the following best describes extinction?

a. It is the prevention of a response through the withholding of all positive consequences for that response.

b. It is the elimination of a response by presenting negative consequences for it whenever it occurs.

c. It is the elimination of a response by withholding all positive consequences for it.

---

12 Another way to extinguish unwanted behavior is to reinforce incompatible behavior. This must be done simultaneously with the withholding of reinforcement. Supposing a member of the catapult crew were slacking off, yet receiving reinforcement of a smoke break along with all the other members of the crew.

How might you extinguish the unwanted behavior successfully?

a. You could withhold his reinforcement by giving him some chore to do while the others were taking a smoke break, and at the same time make a point of praising him on the rare occasions when he appears to be working hard.

b. You could allow him to take a smoke break with the other members of the crew, yet at the same time make a point of praising him on the rare occasions when he appears to be working hard.

13 Select from the list below the two ways in which a leader may extinguish unwanted behavior in subordinates.

a. Shaping the undesired behavior

b. Reinforcing behavior which is incompatible with the undesired behavior

c. Withholding all positive reinforcement for the undesired behavior

---

14 Now let's discuss punishment and the role it plays in controlling behavior.

Punishment consists of presenting an aversive stimulus following an unwanted response. Punishment is presented for the purpose of decreasing the likelihood of the response being repeated. Aversive events used in punishment are known as punishers. Punishers are any circumstances which are painful, threatening, frightening, disturbing, uncomfortable or boring; for example, extra duties, loss of pay, withholding of liberty, confinement, reprimands.

Match each term with the appropriate description.

a. Withholding of positive reinforcement

b. Punishment

1) Decreases the probability that an undesired response will be made

2) Extinguishes unwanted behavior.

3) Changes behavior through use of successive approximations

15 Use of punishment as a single means of controlling behavior has a shortcoming. It tends to suppress the unwanted behavior only as long as the threat of punishment persists. As soon as the threat is removed, the former behavior patterns usually tend to recur.

A division officer has continually recommended punishment as a way of dealing with an insubordinate seaman.

What is the probable outcome of his approach?

a. The seaman will continue his insubordinate behavior as soon as the threat, or the memory, of punishment wears off.

b. The seaman will probably change his behavior for the better, since his insubordinate behavior has been extinguished through punishment.

---

16 Punishment can be useful in eliminating undesired behavior if it is used in conjunction with other operations--such as extinction of undesired responses--or--conditioning of alternative, desired responses.

Presentation of punishment can also be used as a signal to the individual that he has made an undesired response. Once he understands this, he can better change his response to the desired one--provided, of course, that he knows what the desired response may be.

In which example below is punishment being correctly applied?

a. A company officer is mildly castigating (punishing) a fourthclassman for not having correctly learned the manual of arms. He then threatens to put the fourthclassman on report if he doesn't learn how to correctly execute the manual of arms by the next drill period.

b. A company officer is mildly castigating (punishing) a fourthclassman for not having correctly learned his manual of arms. At the same time he is explaining the correct manual to the fourthclassman.

This is the end of Programed Sequence 2. Now, go to the next page and take the Quiz.

Summary Post-Quiz 2

Concepts and Operations in Controlling Behavior

Answer the following questions as indicated in your Student Guide.

---

1. A midshipman spends the entire first semester at the Academy studying French for the first time. He has learned the meaning and use of the words, but has not been able to correctly pronounce them. Therefore, he is always self-conscious about his oral performance in class.

Which one of the following procedures should be used by the instructor to eliminate the midshipman's problem?

a. The instructor should praise the midshipman for each successively better attempt at pronunciation, raising his standards as the midshipman improves.
b. The instructor should not correct the midshipman's mispronunciation, but should wait until his pronunciation is good before giving him any grade above "C."
c. The instructor should praise the midshipman only after he pronounces each word correctly, three times in a row, since only then would the midshipman be doing "A" work.
d. The instructor should be critical of the midshipman whenever he makes an error in pronunciation, but give him "A's" anyway.

---

2. Which one of the following best describes "reinforcement?"

a. A consequence of a stimulus which extinguishes our tendency to respond
b. A consequence of our response which is of value to us
c. An event which increases the probability of that response, if made a condition of that response

3. Match each of the steps in stimulus control with the appropriate numbered activity.

a. Identify the stimuli which currently control the behavior

b. Reinforce the behavior

c. Determine the components of the desired response

d. Arrange the stimulus conditions which will result in the desired response

1) An instructor at the Academy is dissatisfied with the performance of a certain class on homework papers. He has consistently assigned homework, but never given grades on it or handed back the papers.

2) The instructor has noticed that improvement has occurred in the past when additional homework was required and when graded papers were returned to the students, and the improved students were rewarded with lighter homework assignments.

3) The instructor recognizes superior achievement in the manner described.

4) The instructor announces the criteria for a good paper, and states that the graded papers will be returned and that students who exceed the standards will be rewarded with lightened homework assignments and that those who fail to meet the standard will be required to continue doing the increased homework.

4. Which of the following best describes extinction?

   a. The elimination of behavior through the consistent presentation of negative consequences for that response

   b. Suppression of behavior whose occurrence prevents the occurrence of the desired behavior

   c. The elimination of a response from an individual's repertoire through the withholding of all positive consequences for that response

   d. Reinforcement of behavior which is the exact opposite of the desired behavior

---

5. In which one of the following examples does the squad leader employ the principle of reinforcing incompatible behavior during extinction to achieve a change in the behavior of a fourthclassman?

   a. The squad leader should discipline all of the fourthclassmen in that squad so that they will force the offender to come to formations in the proper uniform.

   b. Since he is getting no results anyway, the squad leader ceases entirely giving verbal reprimands for this uncooperative underclassman.

   c. The squad leader increases the frequency and intensity of the verbal reprimands and combines them with more severe disciplinary action.

   d. In addition to intermittent verbal reprimands, the squad leader offers "carry-on" at the table to the fourthclassman whenever he does appear properly dressed at formations.

6. Match each type of reinforcement schedule with the appropriate example.

a. Fixed ratio
b. Fixed interval
c. Variable interval
d. Variable ratio

1) A certain instructor at the Academy was known to administer several unannounced "spot" quizzes per semester to make sure that the midshipmen studied on a regular basis.

2) Paychecks are distributed to all midshipmen on the last day of each month.

3) A midshipman in training is told "good" by his instructor after a random number of accurate rifle "hits" on the target.

4) A Commanding Officer praises his men every second time that they do well.

Now, check your answers on page 60.

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ANSWERS TO SUMMARY POST-QUIZ 2

1. a
2. c
3. a-1, b-3, c-2, d-4
4. c
5. d
6. a-4, b-2, c-1, d-3

This is the end of Part Two, Segment III.

United States Naval Academy

INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PART TWO
INDIVIDUAL BEHAVIOR

Segment III
Learning

Progress Check

WESTINGHOUSE LEARNING CORPORATION
Annapolis, Maryland
1971

LEARNING

PROGRESS CHECK

Question 1.

Of the following descriptions which can be considered an example of instinctive behavior?

1) Geese flying south for the winter
2) The contraction of the pupils of the eye in response to a sudden flash of light
3) A dog coming at the call of his master

a. 1

b. 2

c. 3

d. 1 and 2

Question 2.

Of the following, the example which best distinguishes the differences between performance and acquirement is:

- a. Acquirement refers to the degree of learning which can be observed; performance, to the observable improvement in a behavior.
- b. Acquirement refers to the process of learning new behaviors; performance refers to any observable behavior demonstrating what the individual has learned.
- c. Performance refers to the rate of learning processes; acquirement, to a requisite skill for performance.
- d. None of the above

Question 3.

The following example illustrates a certain type of learning.

An alarm sounds while you are asleep on a submarine. You must determine whether it is a diving alarm or a collision alarm since you must perform certain tasks immediately if it was the collision alarm.

The type of learning involved in this situation is:

- a. Discrimination
- b. Problem solving
- c. Verbal
- d. Motor

Question 4.

An ensign on shore leave fails to show up for a scheduled plane flight. He had not thought about alternative transportation and was unable to obtain any except by public bus, which will make him several hours late. He calls and tells his Commanding Officer.

What action should the Commanding Officer take in order to cause a desirable behavior change in the ensign?

a. Provide positive reinforcement because he called.

b. Tell him off over the phone in an attempt to stimulate him to find another way back to the base, sooner than the bus.

c. Acknowledge his call; point out that you appreciate his effort to keep you informed; and make it clear that you want to discuss the matter with him upon his return to base.

d. All of the above would have equal effectiveness in changing behavior.

Question 5.

Most learning curves have an irregular nature, that is, they indicate a fluctuation of performance during learning. This can be best explained by:

a. A loss of or change in motivation

b. Presence of unconditioned stimuli

c. Both of the above

d. None of the above

Question 6.

Usually the amount of time necessary for qualification for service on a submarine is nine months. Seaman Thomas learned the various systems and procedures necessary to qualify, in five months.

The best use of positive reinforcement would be:

a. Let him go through the remaining training without taking any tests.

b. Commend him and give him his dolphins.

c. Designate him qualified now, and give him his dolphins when his class receives theirs.

d. Tell him that because he is working faster than the others he is authorized to help them learn.

Question 7.

MIDN Parker's parents have a habit of calling him once a week to find out how he is and how he is doing at the Academy. These calls often come at inconvenient times for MIDN Parker, and occasionally his parents have become concerned because they couldn't reach him immediately. MIDN Parker has complained to his parents about this, but they persist in calling.

How could MIDN Parker best extinguish this undesired behavior?

a. He accepts the calls from his parents but is extremely unresponsive and uncommunicative in conversing with them.

b. He continues to complain to his parents about the calls, stressing how inconvenient they are.

c. He continues to accept the calls from his parents, but is brief and uncommunicative in his conversations. At the same time, he establishes a habit of calling them at times convenient for him, and being extremely responsive and communicative in these calls.

d. He refuses to accept the calls from his parents and has his roommate make some excuse each time they call.

Question 8.

Which of the following most adequately states the difference between punishment and extinction?

a. Extinction refers to the withholding of all positive consequences for a response thereby eliminating that response; punishment suppresses a response by presenting an aversive stimulus following the response.

b. Punishment suppresses unwanted behavior through the presentation of positive consequences to an alternate behavior; extinction refers to suppressing unwanted behaviors through the presentation of an aversive stimulus.

c. Extinction refers to reinforcing an incompatible behavior with the one being extinguished; punishment is the withholding of positive consequences of behavior.

d. Punishment is a means of changing behavior by increasing the likelihood of some other response; extinction is a decrease in the likelihood of some response by presentation of an aversive stimulus.

Question 9.

Which two of the following phrases complete the definition?

A negative reinforcer:

1) Is that consequent event which terminates an existing aversive stimulus

2) Removes a rewarding reinforcement

3) Increases the probability of the response it is contingent upon

4) Decreases the probability of the response it is contingent upon

a. 1 and 2

b. 2 and 3

c. 1 and 4

d. 1 and 3

Question 10.

In a situation where a man is consistently late for a watch, the correct method to achieve a desirable behavior change using punishment is:

a. Make him recite "I will not be late to watch" every time he sees you.

b. Administer some after-hours instruction in promptness, and if the man continues to be late, put him on report.

c. Say nothing to the man about his continual lateness, but when the ship reaches port two weeks later, see that he is deprived of his liberty card.

d. Both a and b above

PROGRESS CHECK ANSWER AND REMEDIATION FORM

PART Two SEGMENT III

REMEDIATION TEXT Syndactic Text - Vol - II-B

ITEM	ANSWER	REMEDIATION REFERENCE
1	a	Summary 1: Pages 1-3
2	b	Summary 1: Pages 3-4
3	a	Summary 1: Pages 3-10
4	c	Summary 2: Pages 35-38
5	a	Summary 1: Pages 3-6
6	b	Summary 2: Pages 35-36
7	c	Summary 2: Pages 38-40
8	a	Summary 2: Pages 38-40
9	d	Summary 2: Pages 35-36
10	b	Summary 2: Pages 38-40
11	☐	
12	☐	
13	☐	
14	☐	
15	☐	

United States Naval Academy

INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PART TWO
INDIVIDUAL BEHAVIOR

Segment IV
Factors Affecting Learning

Syndactic Text
Single Volume
(ST/SV)

WESTINGHOUSE LEARNING CORPORATION
Annapolis, Maryland
1971

FOREWORD

"To every thing there is a season,
and a time to every purpose under the heaven:
A time to get, and a time to lose;
a time to keep, and a time to cast away:"

Ecclesiastes 3: 1, 6

Learning capability is dependent on the situation, the person, the subject, and the method. Extensive research has been conducted on what makes for optimum learning. This segment takes an analytical look at the psychological principles behind particular problems that every learner faces: retention, short cuts to efficient use of time, variability of the task to be learned, and motivation. The reader should not be content to discover what may be helpful to him as a student on a day-to-day basis. It is more important that he file this material away in a memory bank for retrieval when he is later charged with the responsibility for training others.

FACTORS AFFECTING LEARNING

Summary 1

In previous discussions, we dealt with some of the general principles relative to learning, performance, and the control of behavior in animals and in humans. In this segment we shall discuss behavior that is uniquely human--the use of language, and some factors which affect the acquisition and retention of verbal responses and skills.

Reinforcement--Extrinsic and Intrinsic

The pigeon in the Skinner box pecked a key which released a pellet of food, and was thus conditioned to continue pecking the key. The pellet functioned as a positive reinforcement of the behavior of pecking the key. Positive reinforcement, you may recall, is an environmental consequence of our behavior which increases the likelihood that the behavior will recur in the future. Reinforcement is essential to the process of learning. It may be either intrinsic or extrinsic. For example, two plebes might both be engaged in marksmanship training with the caliber-.45 pistol. One has hunted as a hobby for many years. The other has never had occasion to fire a weapon before. Both men are firing well enough to qualify as marksmen, but each is receiving a different kind of reinforcement. The first plebe is thrilled at the challenge involved in mastering a different weapon, and the act of shooting provides its own reward. For him, shooting is said to have intrinsic reinforcing properties. The other plebe, conversely, is being extrinsically reinforced. He is visibly afraid of the weapon and obviously unhappy while firing, but he wishes to do well in all his Academy activities and to qualify as a marksman. Extrinsic reinforcement motivates a person to action, but has no inherent relationship to the task itself. Praise, grades, awards and decorations are all examples of extrinsic reinforcement. Extrinsic reinforcement is most effective if administered immediately following the response which it is reinforcing. Delay in reinforcing decreases the likelihood that the proper response will be learned.

Leaders should search for ways to build interest in tasks and skills for their own sakes. Subordinates thus reinforced will have a generally higher level of motivation than will men extrinsically reinforced, i.e., controlled through the traditional methods of rewards and punishments.

Incentive

A junior officer is about to give a group of men training in gunnery. Before he begins, he informs them that successful completion of the course can mean advancement in rating and with it a raise in pay. The rating badges and money serve as goals which, it is hoped, will provide a strong level of extrinsic motivation in the men. Such extrinsic goals, deliberately used to motivate behavior, are called incentives.

A community that is seeking new industry may provide economic incentives in the form of tax deductions in order to motivate corporations to build plants there. In the lab, food may be used as an incentive to motivate a hungry pigeon to learn to discriminate between different keys.

The more highly motivated learner is more likely to correctly respond to a given stimulus and therefore receive reinforcement. Clearly, reinforcement cannot occur if the subject is not motivated to make the correct response at all.

Feedback

A professor hands a midshipman a corrected paper. From the corrections, the midshipman can determine whether or not his answers--or his responses--are correct. He is receiving information on the results of his behavior. In psychological terms, the corrected paper provides him with feedback. Feedback is an extremely valuable element in the control of behavior. It enhances both the learning of new responses and the motivation to perform those responses in the future.

Without feedback, (e.g., if your papers were not corrected and graded, and there were no comments from the professor) you would have no way of knowing whether your responses were correct and whether your actions were producing the desired outcome. Feedback enables you to adjust your behavior to compensate for errors. You are able to eliminate responses that are shown to be incorrect and, if you know the degree of error, you can precisely correct those responses which are partially wrong.

Research indicates that if a person receives feedback as to the correctness of his performance, he will learn more quickly than an equally motivated person who receives no feedback. Like reinforcement, feedback is most effective when provided immediately after a response.

Feedback need not come from another person. For example, the marksman who sees his bullet holes in the target receives just as much immediate feedback as the one who is informed of his accuracy by a colleague. Feedback can also function as an incentive. The mere awareness of progress, which is relayed to the learner by means of feedback, serves to motivate behavior. In any attempt to improve a subordinate's learning capacity, a leader should remember to use feedback. Feedback, when used as a basis for adjusting behavior, increases learning and motivation.

Verbal Learning

At this point, we will look at some of the factors which influence our learning of verbal associations--the relationships between words.

Meaningfulness of Material

Suppose we were to show a midshipman two lists of words; list A, containing unfamiliar words composed of nonsense syllables, and list B, containing words with which he was familiar. Which list do you think would be easier for him to memorize? List B, obviously, since it is more meaningful. Any time we attempt to learn material involving verbal associations, the ease and speed with which we learn depends on the meaningfulness of the material. Meaningfulness can be measured by the number of associations an individual makes in a given period of time to a specified stimulus.

The more associations a person can make with a given word in one minute, the more meaningful the word. Laboratory studies involving memorization of lists bear out the fact that the more meaningful the material is to the subject, the more quickly it is learned.

Use of Mediators

Verbal learning involves the association of stimuli and responses where either or both are words.

Associations are fostered by the use of verbal mediators. A verbal mediator is a previously learned and already meaningful verbal response. It can be interposed between a stimulus and a desired response and serves as a link, a new verbal association having developed because of the mediator. For example, assume we are studying the values of resistors and want to remember that a copper-colored band on a resistor signifies the number one. The learning process can be made easier by using a verbal mediator--by interposing a new verbal association such as "penny"--between the stimulus and response terms. A penny is copper-colored and has a value of one cent. Once an instructor communicates the association, his students are likely to think "one" each time they see a copper band. In this case, the use of a mediational device will facilitate learning and increase retention. Thus, use of verbal mediators is especially useful in teaching. There are, then, three essential conditions if learning is to progress at the fastest possible rate. First, the material being taught should be meaningful. Second, the learning process should be structured so that previously learned responses will mediate the new stimulus-response associations. Third, detailed feedback as to the extent and direction of all errors must be provided immediately following each response. Yet even under the best conditions, it is usually necessary for a subject to practice repeatedly before he has mastered a new skill or association. Thus scheduling practice time affects learning. We have to know which schedule best facilitates learning.

Practice Schedules

Massed practice--a schedule using long, concentrated practice periods--is better for some kinds of tasks. Distributed practice--with short, spaced periods--is better for others. The nature of the learning task and the act of learning are the factors which determine the effectiveness of the two kinds of practice. We can, however, make some generalizations. When we are teaching motor skills, for example, or rote memorization, it is normally more effective to keep practice periods short and well distributed. Motor tasks practiced for long periods of time tend to bring about muscular fatigue and falling off in coordination, and eventual regression in performance. Rote memorization conducted over a long period simply becomes boring. Fatigue, boredom and regression in performance all undermine motivation--and consequently, cut down on the rate of learning.

A significant experiment in the area of practice scheduling took place at the Naval Academy in 1966. In one part of the experiment, three groups of midshipmen were asked to write the alphabet upside down, backwards, and from right to left. Each was given five minutes in which to perform this rather unchallenging task as many times as possible. Group one, however, had massed practice--the midshipmen wrote for five minutes straight without resting. Group two was given a thirty-second rest at the end of each minute of practice, while group three was given a one-minute rest after each minute of practice. As you might guess from the boring nature of the task, the two groups with distributed practice outscored the group with massed practice. In addition, the group that took one-minute rests outscored the group with thirty-second rest periods. One thing proved by this experiment is that other things being equal, longer rest periods usually make for faster learning of routine tasks than do shorter rest periods for a given amount of practice.

Figure 1

On the other hand, for learning ideas and principles and for solving logical reasoning problems, it is usually more effective to start with a concentrated period of massed practice. Later on, it is often good to switch to a schedule of distributed practice.

This is the end of Summary 1. Now, go to Summary Pre-Quiz 1 on the next page.

Summary Pre-Quiz 1

Answer the following questions as indicated in your Student Guide.

---

1. Select the statement which best differentiates between intrinsic and extrinsic reinforcement.

   a. Extrinsic reinforcement is some reward or feedback, unrelated to the task itself, which causes a person to engage in, or continue some behavior. Intrinsic reinforcement is that feedback or reward which comes from satisfaction or pleasure in engaging in a behavior for its own sake.

   b. Extrinsic reinforcement results from the inherent reinforcing properties of a task. Intrinsic is that which motivates a person to engage in behavior for the sake of a contingent event which has no inherent relationship to the task.

   c. Extrinsic reinforcement is any behavior which offered beforehand as incentive, is reinforcing. Intrinsic motivation is any subsequent event which is reinforcing.

2. A company officer during plebe summer indoctrination has been assigned the task of training a large number of plebes, many with no previous military background, in the basic military arts. He is also expected to familiarize them with life at the Naval Academy and its routine discipline. In which of the following is incentive being provided to motivate the plebes?

a. The plebes are informed during their first week of training that the Commandant of Midshipmen has announced that the plebe company winning the most points in competitive plebe summer activities will be given an extra weekend of liberty prior to Parents' Weekend.

b. The company officer keeps a chart in his desk showing the progress of each plebe in the company.

c. The company officer keeps a large graph outside his office that shows the competitive standing of his company relative to other companies in the battalion.

---

3. In which of the following examples is the learner receiving feedback?

a. A student spends four hours studying his text for a quiz the next day on differential equations.

b. A student receives his graded test paper back from his professor.

c. A plebe salutes the midshipman officer of the watch for the first time.

d. A midshipman learning to sail makes a mistake in steering and his boat capsizes.

4. A student of Latin is faced with the task of learning the Latin word "pugnare" for the English infinitive "to fight." He remembers that the English word "pugnacious" is another word for belligerent.

Which word or phrase is being used as the mediator?

a. Pugnacious

b. Pugnare

c. Belligerent

---

5. Which of the following practice/rest cycles should you expect to be preferable when memorizing the Morse code?

a. 15-minute practice--1-minute rest

b. 15-minute practice--10-minute rest

c. 60-minute practice--10-minute rest

d. 60-minute practice--60-minute rest

6. Select the paragraph which best describes the effects of massed vs. distributed practice on learning.

a. Because they are boring, rote and motor learning tasks are best learned through massed practice which serves to get them over with quickly. Distributed practice is most effective for problem solving because learning very small units of material is easier.

b. Distributed practice is best suited to boring and fatiguing learning tasks because of the long rest periods in between. Logical reasoning problems are dealt with most efficiently through massed practice because they are easier to tackle when divided into smaller segments.

c. Distributed practice avoids the lowered efficiency caused by fatigue or boredom and is thus superior for rote and motor learning. Learning of ideas and principles or problem solving is best accomplished through initial massed practice.

Now, check your answers on page 14.

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ANSWERS TO SUMMARY PRE-QUIZ 1

1. a
2. a, c
3. b, d
4. a
5. b
6. c

If all your answers are correct, go on to Summary 2 on page 29. If you missed one or more questions, go to Programed Sequence 1 on the next page.

Programed Sequence 1

1 Reinforcement is essential to the process of learning. As you may recall, the definition of reinforcement is: any environmental consequence of a behavior which increases the likelihood that the behavior will recur.

Which of the following is an example of reinforcement?

a. A pigeon in a Skinner box continues pecking only at the key which releases a food pellet.

b. A rat presses a lever every 60 seconds to avoid getting a mild electric shock, which he receives if he doesn't press the lever.

c. Both of the above

d. None of the above

---

2 If you answered the question in 1 correctly you recall, too, that reinforcement may be either positive or negative. A positive reinforcer, such as food, increases the probability of a response by its presentation, whereas a negative reinforcer, such as an electric shock, increases the likelihood of a response by its termination.

In addition to the above distinction, reinforcement may be either intrinsic or extrinsic. Intrinsic reinforcement occurs when a person engages in a behavior for its own sake, and receives satisfaction simply from being allowed to engage in the activity.

Two midshipmen are engaged in marksmanship training with a caliber-.45 pistol. One of them, Allen, has hunted as a hobby since he was a boy, and is thrilled at the challenge involved in mastering a new weapon under new circumstances. The other midshipman, Welles, has never fired a weapon before, but is strongly motivated to do well in all his Academy activities and hence, performs well in marksmanship.

Which of these men is receiving intrinsic reinforcement?

a. MIDN Allen

b. MIDN Welles

---

3 Extrinsic reinforcement, on the other hand, motivates a person to action, but has no inherent relationship to the task itself. Some examples of extrinsic reinforcement are grades, praise, awards, and decorations. Extrinsic reinforcement is most effective when administered immediately following the desired response.

Which of the following exemplifies the correct use of extrinsic reinforcement?

a. A professor, at the end of the semester, calls in his superior students and personally congratulates them on their achievement.

b. A professor makes a point of mentioning in class, the day after an assignment was handed in, those students who performed outstandingly.

c. A professor makes a point of making each of his classes so interesting that a student wouldn't miss his class for anything, since the act of participating in such a class is enjoyable.

4 Subordinates who are intrinsically reinforced will have a generally higher level of motivation than will men extrinsically reinforced, i.e., controlled through the traditional methods of rewards and punishments.

It follows that: (Choose one)

a. Leaders should search for ways to build interest in tasks and skills for their own sakes.

b. Leaders needn't strive to seek ways of making tasks interesting, but should concentrate instead on providing extrinsic reinforcement.

c. Any task will provide in itself enough intrinsic reinforcement so as to make it unnecessary for the leader to offer rewards and/or punishments.

---

5 A junior officer is about to give a group of men training in gunnery. Before he begins, he informs them that successful completion of the course can mean advancement in rating and with it a raise in pay. The rating badges and money serve as goals which, it is hoped, will provide a strong level of extrinsic motivation in the men. Such extrinsic goals, deliberately used to motivate behavior are called incentives.

When a community offers tax deductions to companies building plants in the area, it is offering which of the following?

a. Initiative

b. Intrinsic reinforcement

c. Incentive

d. Negative reinforcement

6 A professor hands a midshipman a corrected paper. From the corrections, the midshipman can determine whether or not his answers--or his responses--are correct. He is receiving information on the results of his behavior. In psychological terms, the corrected paper provides him with feedback. Feedback is an extremely valuable element in the control of behavior. It enhances both the learning of new responses and the motivation to perform those responses in the future.

In which example is behavior being altered through feedback?

a. A marksman sees that his shots keep hitting to the left of the mark.

b. A marksman sees that his shots keep hitting to the left of the mark; he therefore moves his hand a bit more to the right before shooting.

---

7 Feedback enables you to adjust your behavior to compensate for errors. You are able to eliminate responses that are shown to be incorrect and, if you know the degree of error, you can precisely correct those responses which are partially wrong.

Research indicates that if a person receives feedback as to the correctness of his performance, he will learn more quickly than an equally motivated person who receives no feedback. Like reinforcement, feedback is most effective when provided immediately after a response.

Which person would learn more quickly?

a. One who receives immediate reinforcement but delayed feedback

b. One who receives delayed reinforcement but immediate feedback

c. One who receives immediate reinforcement and immediate feedback

8 Feedback need not come from another person.

Which of the following men is receiving feedback?

a. A marksman who sees his bullet holes in the target and modifies his aim accordingly

b. A marksman who is informed of his accuracy by a colleague, and modifies his aim accordingly

c. Both of the above

d. None of the above

---

9 Feedback also functions as an incentive. The mere awareness of progress, which is relayed to the learner by means of feedback, serves to motivate behavior. In any attempt to improve a subordinate's learning capacity, a leader should remember which of the following?

a. That feedback, as well as reinforcement is a valuable aid to learning

b. That feedback can never be used as a substitute for incentive

---

10 At this point, we will look at some of the factors which influence our learning of verbal associations--the relationships between words.

Any time we attempt to learn material involving verbal associations, the ease and speed with which we learn depends on the meaningfulness of the material. Meaningfulness can be measured by the number of associations an individual makes in a given period of time to a specified stimulus.

Supposing we were to show a midshipman the following two lists of words. Which would be easier for him to memorize?

a. A list containing unfamiliar words composed of nonsense syllables

b. A list containing words with which he was familiar

11 The more associations a person can make with a given word in one minute, the more meaningful the word. Laboratory studies involving memorization of lists bear out the fact that the more meaningful the material is to the subject, the more quickly it is learned.

Associations are fostered by the use of verbal mediators. A verbal mediator is a previously learned and already meaningful verbal response. It can be interposed between a stimulus and a desired response and serves as a link, a new verbal association having developed because of the mediator.

Which of the following correctly defines a verbal mediator

a. A previously learned and meaningful verbal response which can stimulate the association between a stimulus and a response

b. A previously learned response which takes the place of a new verbal association

---

12 Here is an example of how a verbal mediator can facilitate learning.

> A Naval Academy instructor is teaching his class the values of resistors and wants them to remember that a copper-colored band on a resistor signifies the number one. He introduces the term "penny"--which already carries the association with copper color, and has the value of one cent. By introducing the verbal mediator "penny," the instructor makes it more likely that his students think "one" each time they see a copper band.

Now, read the example on the next page and answer the question.

You are teaching MIDN Thumbs how to tie a bowline. You explain it to him thusly: "Place a loop in the line and with the free end come up out of the hole--over the log--under the limb--over the log and back into the hole."

What is(are) the verbal mediator(s) in this instance?

a. The "bowline"

b. The "limb," the "hole," and the "log"

c. The "loop" and the "knot"

d. None of the above

---

13 To summarize what we've discussed so far: There are three essential conditions if learning is to progress at the fastest possible rate. First, the material being taught should be meaningful. Second, the learning process should be structured so that previously learned responses will mediate the new stimulus-response associations. Third, detailed feedback as to the extent and direction of all errors must be provided immediately following each response.

14 Even under the best conditions, it is usually necessary for a subject to practice before he has mastered a new skill or association. Thus, scheduling practice time also affects learning. We have to know which schedule best facilitates learning.

The nature of the learning task and the act of learning are the factors which determine the effectiveness of the two kinds of practice. We can, however, make some generalizations.

When we are teaching motor skills, for example, or rote memorization, it is generally true that long practice periods cause muscular fatigue and a decline in coordination. Rote memorization practiced over a long period of time simply becomes boring.

What may we generalize from this?

a. Short, well distributed practice periods are best for both motor skill learning and rote memorization.

b. Long practice periods are best for learning motor skills and for rote memorization, since there is time to overcome deficiencies due to muscle fatigue and boredom.

$\boxed{15}$ Massed practice--a schedule using long, concentrated practice periods--is better for learning ideas and principles and for solving logic and reasoning problems. In tasks like these, it is better to start out with a concentrated period of massed practice, then switch to shorter periods of distributed practice.

If a midshipman were attempting for the first time to solve a complex type of physics problem, which kind of practice schedule would be best?

a. Short, distributed practice periods

b. Massed practice periods

c. At first, short, distributed practice periods, then a long period of massed practice

d. At first, a long period of massed practice, then, shorter periods of distributed practice

---

This is the end of Programed Sequence 1. Now, go on to the next page and take the Quiz.

Summary Post-Quiz 1

Answer the following questions as indicated in your Student Guide.

1. A company officer during plebe summer indoctrination has been assigned the task of training a large number of plebes, many with no previous military background, in the basic military arts. He is also expected to familiarize them with life at the Naval Academy and its routine discipline.

In which of the following is incentive being provided to motivate the plebes?

- a. The plebes are informed during their first week of training that the Commandant of Midshipmen has announced that the plebe company winning the most points in competitive plebe summer activities will be given an extra weekend of liberty prior to Parents' Weekend.
- b. The company officer keeps a large graph outside his office that shows the competitive standing of his company relative to other companies in the battalion.
- c. The company officer keeps a chart in his desk showing the progress of each plebe in the company.

2. Select the statement which best differentiates between intrinsic and extrinsic reinforcement.

a. Extrinsic reinforcement results from the inherent reinforcing properties of a task. Intrinsic is that which motivates a person to engage in behavior for the sake of a contingent event which has no inherent relationship to the task.

b. Extrinsic reinforcement is any behavior which offered beforehand as incentive, is reinforcing. Intrinsic motivation is any subsequent event which is reinforcing.

c. Extrinsic reinforcement is some reward of feedback, unrelated to the task itself, which causes a person to engage in, or continue some behavior. Intrinsic reinforcement is that feedback or reward which comes from satisfaction or pleasure in engaging in a behavior for its own sake.

---

3. In which of the following examples is the learner receiving feedback?

a. A student receives his graded test paper back from his professor.

b. A student spends four hours studying his text for a quiz the next day on differential equations.

c. A midshipman learning to sail makes a mistake in steering and his boat capsizes.

d. A plebe salutes the midshipman officer of the watch for the first time.

4. A student of Latin is faced with the task of learning the Latin word "pugnare" for the English infinitive "to fight." He remembers that the English word "pugnacious" is another word for belligerent.

Which word or phrase is being used as the mediator?

a. Belligerent

b. Pugnare

c. Pugnacious

---

5. Which of the following practice/rest cycles should you expect to be preferable when memorizing the Morse code?

a. 60-minute practice--60-minute rest

b. 15-minute practice--1-minute rest

c. 15-minute practice--10-minute rest

d. 60-minute practice--10-minute rest

6. Select the paragraph which best describes the effects of massed vs. distributed practice on learning.

a. Distributed practice is best suited to boring and fatiguing learning tasks because of the long rest periods in between. Logical reasoning problems are dealt with most efficiently through massed practice because they are easier to tackle when divided into smaller segments.

b. Distributed practice avoids the lowered efficiency caused by fatigue or boredom and is thus superior for rote and motor learning. Learning of ideas and principles or problem solving is best accomplished through initial massed practice.

Now, check your answers on page 28.

ANSWERS TO SUMMARY POST-QUIZ 1

1. a, b
2. c
3. a, c
4. c
5. c
6. b

Now, go on to Summary 2 on the next page.

Summary 2

Transfer

What a midshipman learns in the classroom about navigation is hardly likely to prepare him for every situation he might encounter while actually navigating a ship. It should, however, help him to deal with new situations when they arise. First, previous learning will make the situation more meaningful to him. Second, it will have provided him with mediators to use in the new stimulus-response situations. On his summer cruise, then, the midshipman will use previously learned responses. This process is called transfer of learning. It occurs whenever previous learning affects the ease of subsequent learning. When the midshipman applies his classroom knowledge to solving problems arising on a ship's bridge, he is exhibiting positive transfer of learning. In other words, positive transfer occurs when the learning of a prior task makes it easier to learn a present task. If, on the other hand, the learning of a prior task competes or interferes with the learning of a present task, we have a case of negative transfer. Positive transfer of learning can occur only when the already learned task and the new task have similar stimulus-response combinations. Suppose you wanted to learn how to ride a motorcycle. The task would obviously be much easier if you knew how to ride a bicycle.

In other words, you would be making old responses to new stimuli. If, in addition, you knew how to drive a standard shift car, your task would be easier yet.

We can probably assume too, that positive transfer is greater when there is a high degree of learning in the old task--that a highly-experienced auto driver, for example, might learn to drive a motorcycle more quickly than somebody just learning to drive a car. This is an assumption, however, which psychologists have found difficult to prove.

When it is necessary to make new responses to old stimuli, negative transfer takes place. The old, already learned responses to the stimuli get in the way of the new responses--they interfere or compete with them. Essentially, it is necessary to unlearn the old responses--at least in regard to the new situation--before you can learn the new responses. The learning process is necessarily longer and more difficult. An example of negative transfer would be learning to steer in reverse a Jeep with a trailer attached. To steer the trailer to the right, the steering wheel must be turned to the left, just the opposite direction in which it is turned when steering the Jeep by itself.

Retention

In a discussion of learning new behavior, the topic of retention and forgetting is of great importance. Retention and forgetting are opposites. What is not retained is forgotten--what is not forgotten is retained. Researchers have found that the greatest amount of forgetting takes place immediately after learning occurs. Other findings indicate that the better material is learned, the better it is retained. A student who studies his material carefully will usually retain it better than one who simply glances over it. That which is only partially learned certainly can't be completely retained. The more meaningful the material, the better it is learned and therefore retained.

Retroactive Inhibition

In a famous series of experiments performed in 1924 by Jenkins and Dallenbach, it was demonstrated that humans forget relatively little while asleep. This indicates that forgetting is not simply a product of the passage of time. What Jenkins and Dallenbach discovered was that new learning interfered with the recall of the old material and resulted in forgetting. This process--by which the learning of a new task interferes with the performance or the recall of the old task--is known as retroactive inhibition--"retroactive" because the process affects learning which had taken place previously; "inhibition" because there is a blocking of performance or recall. You may have already spotted the relationship between retroactive inhibition and negative transfer. We spoke about how experience in backing up the Jeep by itself makes it difficult to steer backwards a Jeep which has a trailer attached. Now let's carry the example further. The lieutenant spends several days practicing with a trailer limbered to the Jeep. At this point, he is likely to have trouble readjusting to driving the Jeep by itself.

Negative transfer, prior learning--steering the Jeep backwards by itself--interfered with new learning--steering the Jeep backwards with a trailer attached. Retroactive inhibition, new learning--steering a Jeep and trailer backwards--interferes now with retention of prior learning--backing up a Jeep by itself. After learning to steer a Jeep and trailer backwards, retroactive inhibition would decrease retention of normal automobile steering skills. The reason for this is that the individual has learned an opposite response to similar stimuli. However, interference would be greatly diminished if the two learning tasks required similar responses to similar stimuli. For example a person skilled in steering a sailboat would experience little negative transfer and little retroactive inhibition when he began steering a tiller-steered motorboat.

Finally, when two learning tasks are entirely dissimilar, there is little interference. Learning the response of steering a sailboat has little effect on the midshipman's retention of a statistical formula. Figure 2 on the next page shows how retention and forgetting are related to the similarity of materials learned.

TWO LEARNING TASKS			
WHEN STIMULI ARE AND	WHEN RESPONSES ARE	THEN THE DEGREE OF INHIBITION IS	EXAMPLE
Similar	Similar	Minimum	Steering a sailboat and steering a tiller-steered motorboat
Similar	Antagonistic	Maximum	Backing up a Jeep alone and backing up a Jeep pulling a trailer
Dissimilar	Dissimilar	Mimimum	Steering a sailboat and memorizing a statistical formula

Figure 2

How You Can Improve Learning

Sleeping immediately after learning is the best possible way to maximize your retention of learned material. Beyond this, the most effective thing you can do is learn your material as thoroughly as possible. One way you can do this is to search for mediational devices to make the material more meaningful. A good instructor or a good testbook will provide you with a good supply of mediators. A good student will devise additional ones for his own use. Another thing you can do is overlearn your material. This involves continued study of the material after barely mastering it. Let's assume that you are required to memorize a dozen chemical formulae. Suppose it takes you a dozen times of going over the list before you have it memorized--or mastered. If you then go over the list--or practice--an additional dozen times, you have accomplished 100% overlearning. Experiments indicate that 50% overlearning produces a considerable improvement in recall, particularly over a period of time. Mere mastery might be enough to keep the list in your mind for an hour or so--until you have passed a test on it, for example. But overlearning helps you retain the material over longer periods of time.

Review, on the other hand, is a matter of subsequent practice. You learn to drive a car and then constantly review your learning by driving almost every day. If you were to periodically use the chemical formulae you learned in lab work, you would not be likely to forget them readily. Review, then, is a significant aid to retention. Review is particularly useful when done shortly after the initial learning process. If you were to review your list of formulae the day after you learned it--or better yet, later the same day--it would probably be more useful than review a week after learning.

In conclusion, for optimum retention, sleep immediately after learning. If that isn't practical, concentrate on learning your material as well as possible. To help you do this: 1) devise mediators in order to make the material more meaningful, 2) carry the learning process beyond mere mastery by overlearning, and 3) promote retention of the material from time to time through review.

This is the end of Summary 2. Go on to Summary Pre-Quiz 2 on the next page.

Summary Pre-Quiz 2

Answer the following questions as indicated in your Student Guide.

---

1. Select the paragraph that correctly differentiates the concepts of negative and positive transfer.

   a. Negative transfer occurs when a new task is more difficult to learn because of interference from a previously learned task. Positive transfer occurs when the learning of a prior task facilitates the learning of a new one.

   b. Negative transfer results when the task to be learned involves making previously learned responses to new stimuli. Positive transfer results when new responses must be learned to old stimuli.

   c. Learning to make new responses to old stimuli produces negative transfer. Learning to make old responses to new stimuli results in positive transfer.

2. Each item in the right column describes a pair of learning tasks. Match each pair with the kind of transfer that might be expected to occur.

a. Positive transfer

b. Negative transfer

1) Learning to conjugate the German verb "machen"--to make (machte, gemacht) and learning to conjugate the German verb "decken" --to cover (deckte, gedeckt)

2) Learning to read a sentence aloud in French and learning to read the same sentence aloud in Spanish

3) Learning that > means "is greater than" after you incorrectly learned it meant "is less than"

4) Learning to stop on a green light and go on red. Learning to stop on a red light and go on green

5) Learning to find the sum of -8 plus -27 and learning to find the sum of -52 plus -7

3. Which of the following statements correctly defines retroactive inhibition?

a. Retroactive inhibition occurs when new learning competes with the retention of a previously learned task.

b. Retroactive inhibition occurs when prior learning interferes with new learning.

c. Retroactive inhibition occurs when new learning is made easier because of previous learning.

4. In which example is lack of retention due to inadequate original learning?

a. A trainee has scanned the basic principles of his radar equipment in his training manual and has gone to sleep for four hours. Upon waking he can't recall any of the principles he learned.

b. A new recruit learns the name and rank of his Commanding Officer. After one day he has met many other officers and cannot recall the name of his Commanding Officer.

c. A student read and learned thoroughly the Constitution of the United States when in high school. In an exam later in a college history course he cannot recall the 17th and 22nd amendments.

---

5. If a midshipman is required to learn a list of 20 French nouns by the end of the first week of class, which approach is most likely to promote retention?

a. Read over the list the first night but wait until the last night to memorize it. The more recently the list is memorized, the better it will be retained.

b. Read over the list and make as many meaningful associations to the words as possible. Learn the list the first night and practice a few times after learning. Go over the list briefly each night during the week.

c. Memorize the list thoroughly the first night. Review it briefly the last night making as many new associations as possible.

Now, check your answers on page 40.

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ANSWERS TO SUMMARY PRE-QUIZ 2

1. a

2. a-1, 5; b-2, 3, 4

3. a

4. a

5. b

If all your answers are correct, you have completed this segment. If you missed one or more questions, go to Programed Sequence 2 on the next page.

Programed Sequence 2

OVERVIEW: In this programed sequence we shall discuss how learning one task may affect learning another task. This process is called transfer, and may be either positive or negative. We shall then discuss retention, and some ways in which you may improve your learning skills.

1 The things a midshipman learns at the Academy cannot possibly prepare him for every situation he is likely to encounter when actually navigating a ship. What the midshipman learns in the classroom can, however, make future, real life situations more meaningful. It can also provide the midshipman with mediators which will help him understand and deal with a new stimulus response situation.

How may classroom learning affect future action?

a. It makes future situations more meaningful.

b. It provides mediational devices which help the individual to deal with new situations.

c. Both of the above

d. None of the above

2 Whenever previous learning affects the ease of subsequent learning, we say transfer has occurred.

When a midshipman on summer cruise uses responses which he learned previously at the Naval Academy, he is exhibiting which of the following?

a. Transformation of learning

b. Transfer of learning

c. Translation of learning

d. Transmission of learning

---

3 Transfer of learning may be positive or negative. When past learning makes present learning easier, we say positive transfer has occurred.

Which of the following is an example of positive transfer?

a. During summer cruise a midshipman applies his classroom knowledge to solving a problem which arises on the ship's bridge.

b. A midshipman, while learning to steer a sailboat, attempts to apply principles he learned in steering a car.

4 In choice b of frame 3, the midshipman who tried to apply principles learned in steering a car to learning to steer a boat, is an example of negative transfer.

Which of the following best defines negative transfer?

a. Negative transfer occurs when the learning of a previous task facilitates the learning of subsequent tasks.

b. Negative transfer occurs when the learning of a past task has no effect on the learning of a present task.

c. Negative transfer occurs when the learning of a past task interferes with or makes more difficult the learning of a present task.

---

5 Naturally, negative transfer makes the learning process longer and more difficult. Suppose two persons were attempting to learn to steer in reverse a Jeep which was hauling a trailer. To steer such a Jeep to the right in reverse, one must turn the steering wheel to the left, just the opposite direction from the way it is turned when backing up the Jeep alone.

Which of the following men would be likely to have difficulty steering a Jeep with a trailer in reverse because of negative transfer?

a. A man who had experience in steering a trailer truck in reverse

b. A man who had experience driving only nontrailer vehicles all his life

6 To put it another way, positive transfer occurs when you have to learn to make old responses to new stimuli--e.g., learning to ride a motorcycle once you already know how to ride a bicycle. Negative transfer, then, occurs when you need to make new responses to old stimuli.

Suppose a person who is used to dialing the telephone with his right hand has his right hand confined to a cast.

Which kind of transfer is likely to affect his learning to dial the telephone with his left hand?

a. Positive transfer

b. Negative transfer

---

7 In addition to the problem of transfer of learning, another important facet of learning is retention. Retention is, of course, what one correctly remembers after learning takes place. What is not retained is forgotten.

Which of the following best describes retention?

a. Retention refers to the repression, or forgetting, of a previously learned task.

b. Retention refers to the amount correctly remembered of a previously learned task.

8 Research has found that the greatest amount of forgetting takes place immediately after learning takes place.

Thus, when would it be best to test a person on how well he had learned a physics formula?

a. Immediately after he had learned it

b. A considerable time after he had learned it

---

9 Research has further discovered that the better material is learned, the better it is retained.

Keeping the above in mind, which of the following midshipmen is likely to retain the most of a set of German verbs he has been given to study for one-half hour?

a. The midshipman who has read, reread, and recited aloud the list for the entire half hour

b. The midshipmen who has scanned the list, and then spent the remainder of the half hour working on another assignment

10 In a famous series of experiments performed in 1924 by Jenkins and Dallenback, it was found that humans forget relatively little while asleep. This indicates that forgetting is not simply the result of passage of time. What this experiment further proved, was that new learning interfered with the recall of old material and resulted in forgetting.

Which person is most likely to forget a newly learned task A?

a. The one who goes immediately to sleep after learning task A and is tested on awakening

b. The person who learns task B immediately after learning task A and then is tested on task A

11 The process by which learning of a new task interferes with recall or retention of an old task is called retroactive inhibition. It is called "retroactive" because previous learning is affected, and "inhibition" because it consists of blocking of performance or recall.

Let's return to our example of the trailer limbered to a Jeep. Consider the person who has learned to steer the Jeep in reverse, with the trailer attached. He may then experience difficulty readjusting to backing up a Jeep by itself. In this case, new learning--to steer a Jeep and trailer backwards--interferes with retention of prior learning--backing up a Jeep by itself.

This is an example of which of the following?

a. Retroactive inhibition

b. Negative transfer

c. Positive transfer

Consult Figure 2 on the next page, then answer frames 12 and 13.

TWO LEARNING TASKS			
WHEN STIMULI ARE AND	WHEN RESPONSES ARE	THEN THE DEGREE OF INHIBITION IS	EXAMPLE
Similar	Similar	Minimum	Steering a sailboat and steering a tiller-steered motorboat
Similar	Antagonistic	Maximum	Backing up a Jeep alone and backing up a Jeep pulling a trailer
Dissimilar	Dissimilar	Mimimum	Steering a sailboat and memorizing a statistical formula

Figure 2

12 When is the least amount of retroactive inhibition likely to take place?

a. When two tasks have similar stimuli and similar responses

b. When two tasks have similar stimuli, but antagonistic or opposite responses

13 When two tasks have dissimilar stimuli and call for dissimilar responses, what degree of retroactive inhibition is likely to occur?

a. Maximum

b. Minimum

c. None

---

14 Match each term with the one correct description.

a. Positive transfer

b. Negative transfer

c. Retroactive inhibition

1) The harmful effect on learning in one situation caused by previous learning in another situation

2) More rapid learning in one situation because of previous learning in another situation

3) An already meaningful response which aids in learning of a new response

4) The harmful effect of new learning on the retention of previous learning

15 Going to sleep immediately after learning is the best way to maximize your retention of learned material. This is often impractical. Beyond this, the most effective way to maximize your retention is to learn your task or material as thoroughly as possible, and use mediators, which can be supplied by a good textbook, a good professor, or by your own ingenuity.

What are two methods by which you can maximize your retention of learned material?

a. Seek and use mediators.

b. Scan the material to be learned, then go to sleep.

c. Learn the material as thoroughly as possible.

16 Another way to increase retention is to overlearn. This means, continue to study your material, task, etc., even after you have mastered it. Assume that you are required to memorize a dozen chemical formulae. Suppose it takes you a dozen times of going over the list before you have it memorized--or mastered. If you then go over the list--or practice--an additional dozen times, you have accomplished 100% overlearning.

MIDN Bell is attempting to memorize a brief speech for an award banquet. He has just got to the point where he can recite it fully without a mistake.

How might he best ensure retention?

a. By reciting the speech several times again--overlearning

b. By writing down the speech several times

17 Review is another significant aid to retention. Review is the subsequent practice of learned material or skills. It is particularly useful when done shortly after the initial learning process.

If you were to review a list of chemical formulae the day after you learned it--or better yet, later the same day--it would probably be more useful than review a week after learning.

A midshipman wishes to achieve optimum retention of material he has studied for an exam. He has learned the material as well as possible, used mediators, and employed overlearning.

What additional step is necessary to promote retention?

a. Retroactive inhibition

b. Review

c. Feedback

This is the end of Programed Sequence 2. Go on to Summary Post-Quiz 2 on the next page.

Summary Post-Quiz 2

Answer the following questions as indicated in your Student Guide.

1. Each item in the right column describes a pair of learning tasks. Match each pair with the kind of transfer that might be expected to occur.

a. Negative transfer

b. Positive transfer

1) Learning to conjugate the German verb "machen"--to make (machte, gemacht) and learning to conjugate the German verb "decken"--to cover (deckte, gedeckt)

2) Learning to read a sentence aloud in French and learning to read the same sentence aloud in Spanish

3) Learning that $>$ means "is greater than" after you incorrectly learned it meant "is less than"

4) Learning to stop on a green light and go on red. Learning to stop on a red light and go on green

5) Learning to find the sum of -8 plus -27 and learning to find the sum of -52 plus -7

2. Select the paragraph that correctly differentiates the concepts of negative and positive transfer.

a. Negative transfer results when the task to be learned involves making previously learned responses to new stimuli. Positive transfer results when new responses must be learned to old stimuli.

b. Learning to make new responses to old stimuli produces negative transfer. Learning to make old responses to new stimuli results in positive transfer.

c. Negative transfer occurs when a new task is more difficult to learn because of interference from a previously learned task. Positive transfer occurs when the learning of a prior task facilitates the learning of a new one.

---

3. If a midshipman is required to learn a list of 20 French nouns by the end of the first week of class, which approach is most likely to promote retention?

a. Read over the list and make as many meaningful associations to the words as possible. Learn the list the first night and practice a few times after learning. Go over the list briefly each night during the week.

b. Read over the list the first night but wait until the last night to memorize it. The more recently the list is memorized, the better it will be retained.

c. Memorize the list thoroughly the first night. Review it briefly the last night making as many new associations as possible.

4. Which of the following statements correctly defines retroactive inhibition?

a. Retroactive inhibition occurs when learning a new task is made easier because of previous learning.

b. Retroactive inhibition occurs when prior learning interferes with new learning.

c. Retroactive inhibition occurs when new learning competes with the retention of a previously learned task.

---

5. In which example is lack of retention due to inadequate original learning?

a. A student reads and learns thoroughly the Constitution of the United States when in high school. In an exam later in a college history course he cannot recall the 17th and 22nd amendments.

b. A trainee has scanned the basic principles of his radar equipment in his training manual and has gone to sleep for 4 hours. Upon waking he can't recall any of the principles he learned.

c. A new recruit learns the name and rank of his Commanding Officer. After one day he has met many other officers and cannot recall the name of his Commanding Officer.

Now, check your answers on the next page.

ANSWERS TO SUMMARY POST-QUIZ 2

1. a-2, 3, 4; b-1, 5
2. c
3. a
4. c
5. b

This is the end of Part Two, Segment IV.

United States Naval Academy

INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PART TWO
INDIVIDUAL BEHAVIOR

Segment IV
Factors Affecting Learning

Progress Check

WESTINGHOUSE LEARNING CORPORATION
Annapolis, Maryland
1971

FACTORS AFFECTING LEARNING

PROGRESS CHECK

Question 1.

PO1 Tracy, a basic electronics instructor, always made it a point to compliment his students when their work warranted it. His class was assembling an instruction kit for a power supply. SA Cale, whose performance had been satisfactory, was having difficulty with the power supply section.

PO1 Tracy observed SA Cale for several minutes and then in a quiet voice talked to him asking him questions and correcting SA Cale's wrong responses. PO1 Tracy let SA Cale know when he thought that Cale had fully comprehended the material. PO1 Tracy publicly complimented Cale and encouraged other members of the class to do as well as Cale.

From the following choices, select the best method used by PO1 Tracy in the above example to teach the task.

a. Extrinsic reinforcement and intrinsic reinforcement

b. Feedback as an incentive and as a basis for adjusting behavior

c. Intrinsic reinforcement

d. Feedback as a basis for adjusting leader behavior only

Question 2.

From the following choices, select the two statements that respectively represent extrinsic and intrinsic reinforcement.

1) ENS Pratt consistently praises his men for jobs well-done, and gives rewards when they are deserved.

2) ENS Banner gives clear, concise instructions and then tests the men to see if they understand.

3) ENS Howe believes in physical fitness and practices PT for one hour each day.

4) ENS Slater informs his men about their progress and the relationship of their achievement to their behavior.

a. 3 extrinsic and 4 intrinsic

b. 2 extrinsic and 4 intrinsic

c. 1 extrinsic and 2 intrinsic

d. 1 extrinsic and 3 intrinsic

Question 3.

SN Roth was attending classes on how to use a soldering iron to make good solder joints in electronic equipment. Although he has studied the instruction material, he consistently made "cold" solder joints during practice. After several failures, SN Roth noticed that the soldering iron was not hot enough to completely melt the solder. He then remembered reading about this problem in the instruction material. When the solder was finally melting properly, SN Roth associated the flowing metal with samples of mercury he had seen before, and how the constant flow of metal left an evenly soldered joint. After several more practice attempts, SN Roth was able to make a good solder joint.

From the following choices, select the methods SN Roth used to learn his task.

a. Acquisition, motivation, and feedback

b. Meaningfulness, mediation, and distribution of practice

c. Extrinsic reinforcement, mediation, and feedback

d. Mediation, retention, and distribution of practice

Question 4.

From the following choices, select the statement that best describes the effect meaningfulness has on learning.

a. As meaningful association and meaningfulness of the task increases, fewer trials are necessary for learning.

b. Meaningfulness is a characteristic of learning that increases as the task progresses toward completion.

c. Meaningfulness and learning are functionally unrelated; thus the former does not affect learning rate.

d. Meaningful responses in an individual's repertoire do not increase his capability for learning new material.

Question 5.

From the following choices, select the statement that best describes the advantages of distributed practice.

a. Distributed practice is useful for learning ideas, principles, and solving logical reasoning problems.

b. Distributed practice reinforces learning by using association, mediators, and positive transfer characteristics.

c. Distributed practice avoids dependency on the rote learning and the task vs. learning principles.

d. Distributed practice avoids the lowered efficiency caused by fatigue or boredom and is superior for rote learning up to a certain level of complexity.

Question 6.

LT Groves was conducting a basic training course on an M-60 air-cooled machine gun. PFC Colt accidentally dozed off for about five minutes of the lecture. However, he listened very closely to the summary the LT gave at the end of the lecture.

When PFC Colt was called to the firing line a few days later, he was unable to work the machine gun. He checked the mechanism and cleared the weapon several times. LT Groves finally had to show him how to set the header spacing.

From the following choices, select the statement that indicates the probable cause for PFC Colt's loss of retention.

a. PFC Colt dozed off because of keen competition in the field.

b. PFC Colt's original learning was inadequate because he heard only the summary statement concerning machine gun maintenance.

c. The time factor of a few days caused PFC Colt to forget the information he had learned.

d. PFC Colt was under stress and didn't respond correctly on the firing line, even though he knew what was required to make the machine gun operate.

Question 7.

In his fifth year as a Navy pilot, LCDR Abelman successfully completed transitional training from single-engine fixed-wing aircraft to rotary-wing aircraft. During training considerable stress and practice was given to emergency landing procedures, which are completely different from the procedures for fixed-wing aircraft. LCDR Abelman had no difficulty with the training and simulated emergency landings.

A few months after his assignment to a helicopter squadron, this pilot was returning to base at the end of a mission. Weather conditions had deteriorated during his mission and he was now faced with landing his "chopper" in rain, reduced visibility and winds gusting to force 3. As he approached the designated landing pad at 300 feet, the helicopter's engine failed without warning. Under the pressure of these circumstances, LCDR Abelman swiftly applied the proper emergency landing procedures--for fixed-wing aircraft. The helicopter crashed and, though crew injuries were light, the chopper was a total loss.

Select the statement which best describes the type of learning transfer that occurred during LCDR Abelman's training in emergency procedures.

a. Neutral/retroactive transfer

b. Negative transfer

c. Stimulus transfer

d. Positive transfer

Question 8.

MIDN Lane was having difficulty with history during the first few weeks of the course. From the following choices, select the statement that describes the approach he should employ to promote his retention of the subject material.

a. MIDN Lane should increase the amount of initial learning by continually practicing after acquirement.

b. MIDN Lane should review the learned material as soon as possible after learning, and as often as possible or necessary.

c. MIDN Lane should use mediation devices to increase retention.

d. All of the above

Question 9.

From the following choices, select the statement that correctly defines retroactive inhibition.

a. Retroactive inhibition refers to the reinforcement of highly similar responses by previous learning.

b. Retroactive inhibition is a state of learning resulting in fatigue, boredom, and lowered efficiency.

c. Retroactive inhibition refers to interpolated learning that may result in decreased performance on the original task.

d. Retroactive inhibition refers to difficulty in new learning due to competition.

Question 10.

MIDN Jarvis is having academic difficulties in remembering the correct method of solving explosives problems in the chemistry course. What principles of review should he employ to assist in increasing his retention of the material presented in class?

a. MIDN Jarvis should take detailed notes but wait until the next day to review them and concentrate on a noncompetitive subject as soon as possible after the chemistry class.

b. MIDN Jarvis should take mental notes only concentrating on what was said in class, get plenty of sleep the following night, and then write the notes out the next day.

c. As soon as possible after the class, MIDN Jarvis should practice doing the explosives problems, making mental and written notes as necessary. He should increase his practice time on the explosives problems between chemistry classes.

d. MIDN Jarvis should review the material only the night before scheduled chemistry classes and make the review the last thing before going to sleep.

BLANK

PROGRESS CHECK ANSWER AND REMEDIATION FORM

PART Two SEGMENT IV

REMEDIATION TEXT Syndactic Text VOL-II-B

ITEM	ANSWER	REMEDIATION REFERENCE
1	b	Summary 1: Pages 1-5
2	d	Summary 1: Pages 1-4
3	b	Summary 1: Pages 4-8
4	a	Summary 1: Pages 4-5
5	d	Summary 1: Pages 6-8
6	b	Summary 2: Pages 30-31
7	b	Summary 2: Pages 29-33
8	d	Summary 2: Pages 30-35
9	c	Summary 2: Pages 31-33
10	c	Summary 2: Pages 30-35
11	☐	
12	☐	
13	☐	
14	☐	
15	☐	

United States Naval Academy

INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PART TWO
INDIVIDUAL BEHAVIOR

Segment V
Attention and Perception

Syndactic Text
Single Volume
(ST/SV)

WESTINGHOUSE LEARNING CORPORATION
Annapolis, Maryland
1971

FOREWORD

"Every shut eye ain't asleep"
an American Negro Proverb

Science is beginning to get a more detailed picture of how the sensory organs function as dynamic information processing systems, and the phenomenon of optical illusions has always intrigued even the amateur psychologist. This segment considers principles of sensory responses and lays the groundwork for some of the more complex patterns of perception. Environment, group pressures, and prejudices are only a few of the factors that influence the shut eye that ain't asleep.

INTRODUCTION TO PSYCHOLOGY
AND LEADERSHIP

PART TWO
SEGMENT V

ATTENTION AND PERCEPTION

Summary 1

In an earlier lesson we discussed adjustive behavior. We defined this as making a response to an environmental stimulus the result of which can then affect future responses to that stimulus. In adjustive behavior all stimuli must be brought into the nervous system to be sorted out and evaluated before the correct response can take place. At this point, two of the most interesting and complex aspects of adjustive behavior come into play: these are attention and perception.

The kind of response that might take place, and the fact that any response at all occurs, is dependent upon these two important psychological factors. Attention is the selection from a great number of potential stimuli, only those stimuli which are related to present needs or interests. Perception is, on the other hand, the discrimination and interpretation of stimuli, that is, determining relationships among them.

Factors Affecting Attention

A vast number of perceivable stimuli is present in any environment. All of them fall within the energy ranges and thresholds to which our receptors can respond--yet we are hardly aware of the majority of them. In other words, of all the stimuli which we are capable of perceiving at any time, we respond to only a selected portion. This process of psychological selectivity is called attention.

Now let's discuss some of the innate factors in the human organism which affect attention. The first and limiting step in attention and perception is the detection of and the discrimination among the variety of stimuli that are constantly present in the environment. This process, known as sensory discrimination, is performed by the sensory mechanisms of our bodies. Basically, stimuli represent environmental energy changes. Each of us is equipped with specialized cells, capable of responding in various ways to certain of these changes. These cells are called receptors--they comprise the sense organs of our bodies. Each receptor responds to a particular kind of physical energy in the environment. Our eyes are receptors for electromagnetic energy in the form of light. Our nose and taste buds respond to chemical energy--these give us the senses of smell and taste. Our sense of touch is generated by several different kinds of receptors--those which respond to mechanical energy, motion, weight, pressure, those which respond to thermal energy (warmth and cold) and finally, those which respond to pain.

Each receptor has as well a certain range of sensitivity. Ultra-sonic sound is an example of an energy value which human receptors are incapable of discerning. By the same token, we do not see X-rays and we do not smell pure air, despite the fact that they represent measurable elements of energy in the environment.

All of our receptors or senses require some minimal level of energy before they are activated--or, to use more technical terms, some minimum absolute intensity of energy to which each will respond. This minimum level is called the absolute threshold. In each of the senses, this threshold varies with the individual. Thus, an individual with normal hearing has to suffer the noise of a fireworks display, whereas a person who is slightly deaf can simply turn off his hearing aid, and will not hear it at all. We sometimes fail to perceive stimuli even when they do fall within both the ranges and the intensities detectable by our receptors. This can happen when our receptors encounter a situation in which they cannot discriminate one stimulus from another, similar one. The degree of difference necessary for an individual to discriminate between two such stimuli is called the differential threshold.

Other factors can have a significant effect on attention. Certain things attract our attention. These are: size, intensity, motion, repetition and contrast. The first attention-getter is size, e.g., the larger a billboard, the more likely we are to notice its message. A second factor is intensity--the louder the sound, the stronger the taste or odor, the more attention we pay to it. Moving and repetitive stimuli both attract the attention more than do stable stimuli. The fifth factor, contrast, is a marked difference in stimulation, such as sudden silence after continuous noise. This too affects attention. Size, intensity, motion, repetition and contrast are all external factors which attract our attention. Internal factors can also affect our attention, such as individual's interests, motives, and state of mind.

To sum up our discussion so far, it should be clear that at any one time, we are selectively aware of only a few of the available stimuli. This process of selection is called attention. It takes place in the mind and nervous system rather than in the receptors themselves.

Perception goes beyond mere sensory reception. It is that process by which we discriminate among stimuli and interpret their meaning.

Organizational Tendencies

There are certain patterns of perception and attention by which we organize stimuli into patterns or objects. These are the organizational tendencies, some of which are: grouping, closure, and figure-ground perception.

Grouping

The first organizational tendency is called grouping. We tend to perceive collections of several stimuli as being grouped into patterns. We group stimuli on the basis of any one of three characteristics: proximity, similarity and continuation.

We tend to view part A of Figure 1, on page 6, as three groups of X's, rather than as six X's. In this case, the factor that leads us to group the stimuli into pairs is proximity--the nearness of the components of the pairs. We tend to perceive stimuli which are close together as belonging together.

The second basis upon which we tend to group stimuli is similarity. This is illustrated in part B of Figure 1. Looking closely, you can see that all the dots form a six-pointed star, or hexagon. However, at first most observers will not see a hexagon. Because the three white dots are dissimilar from the black dots, we instead tend to see a triangle of black dots with the white dots forming their own triangle pattern overlapping it. Although all of the dots are close together, it is not proximity here, but similarity which acts as a main factor in grouping. Similar dots, the black ones, appear to form one group, whereas other similar dots, the white ones, appear to form another group.

A third factor in grouping is continuation. This is illustrated in part C of Figure 1. We tend to see this set of dots as two separate continuous lines, one curved and one straight, even though they intersect and share a common dot at their intersection. As you see, each of the factors, proximity, similarity and continuation, plays a part in the organizational tendency called grouping.

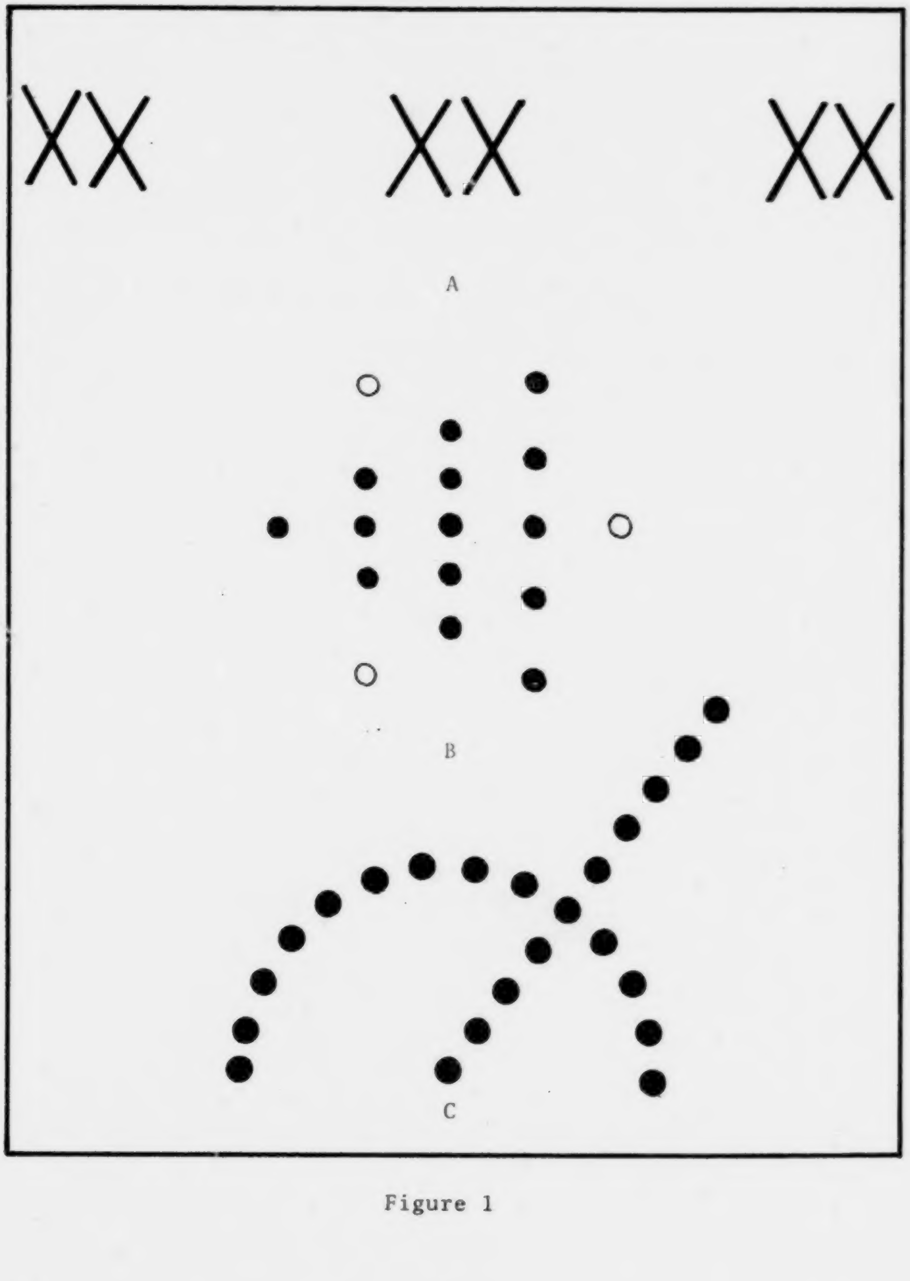


Figure 1

Closure

Now let's discuss a second organizational tendency--closure. This is illustrated in part A of Figure 2 on page 8. In all probability, what you "see" here are four squares. You may be aware that the squares have something missing from them, but the significant thing is that you still see them as squares, not simply as sets of unclosed line figures. Closure is a tendency to fill in gaps in multiple stimuli, so that the stimuli are perceived as whole objects rather than as disjointed parts.

Figure-Ground Perception

We go now to a third organizational tendency--figure-ground perception. In most of our visual perceptions we tend to pick out a specific figure, and see it as against an extended, relatively formless background. In part B of Figure 2 you may have seen a white figure (vase) against a black ground. Or you may instead have seen two black figures (profiles) against a *white* ground. This is a classic example of what is known as a reversible figure-ground relationship, in that each of the elements may be perceived as either figure or ground.

This is the end of Summary 1. Now, take Summary Pre-Quiz 1 on page 9.

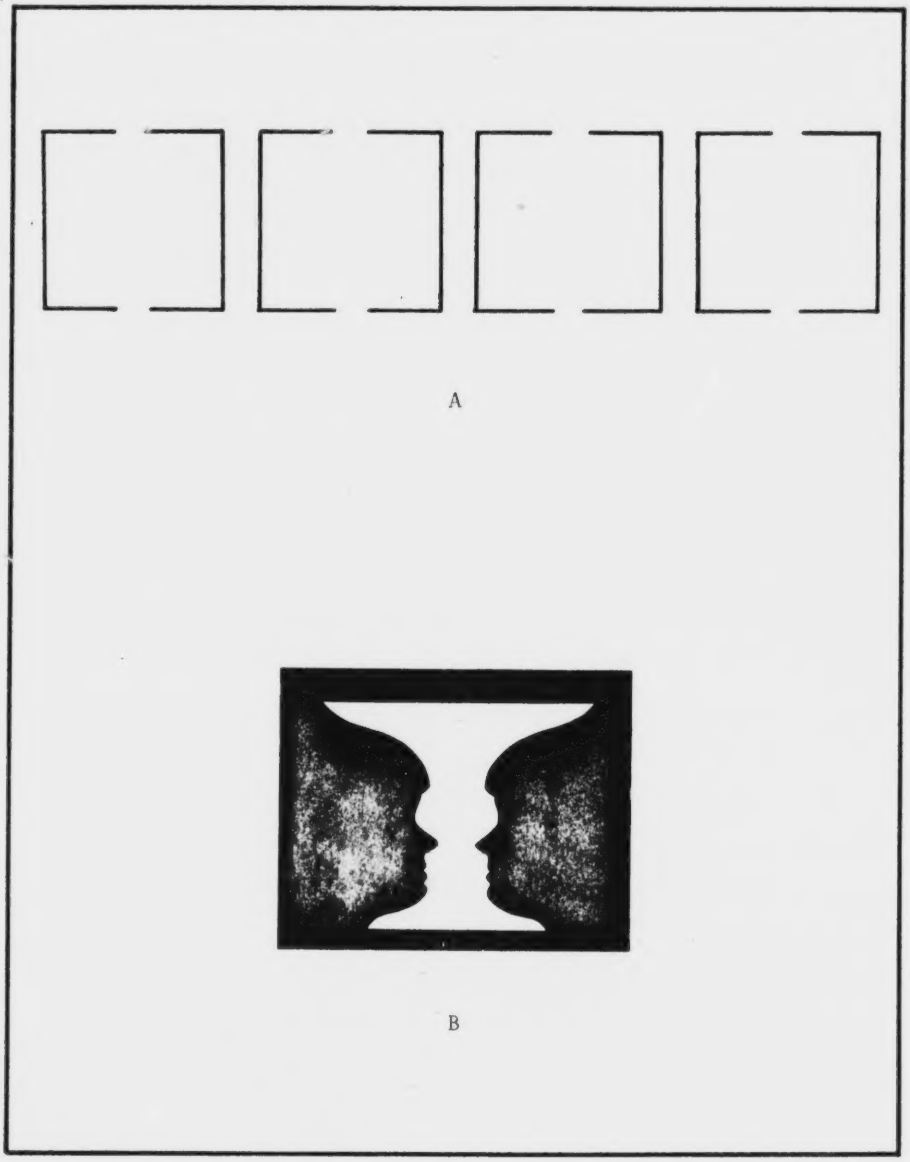


Figure 2

Summary Pre-Quiz 1

Answer the following questions as indicated in your Student Guide.

---

1. Which of the following is the best definition of attention?

   a. A response by which an organism distinguishes or selects specific stimulus elements from all the stimuli presented to us by our environment at any given time

   b. The process by which our sensory receptors interpret stimuli available to us at any given time

   c. A tendency to group stimuli on the basis of proximity, similarity, or continuity

---

2. Match each set of sensory receptors to the types of energy to which it responds.

   a. Touch

   b. Smell and taste

   c. Sight

   1) Mechanical energy

   2) Chemical energy

   3) Electromagnetic energy

   4) Thermal energy

3. Which of the following are external factors that tend to attract attention?

a. Contrast

b. Memory

c. Size

d. Repetition

e. Motivation

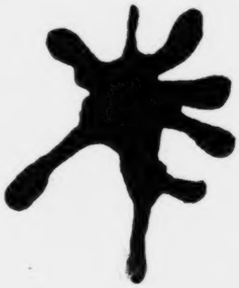
---

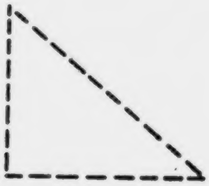
4. Each of the figures on the right illustrates one of the organizational tendencies in the left column. Match the illustration with the tendency.

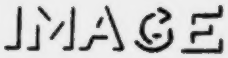
a. Closure

b. Grouping

c. Figure-ground perception

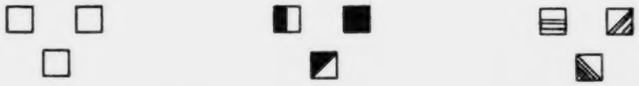
1)  = an amoeba

2)  = a triangle

3) 

= the word "image"

4) X X X X X X = three groups of "X"'s



5. The above illustrates perceptual grouping based on:

   a. Figure-ground

   b. Continuation

   c. Frequency

   d. Proximity

Now, check your answers on the next page.

ANSWERS TO SUMMARY PRE-QUIZ 1

1. a
2. a - 1, 4
   b - 2
   c - 3
3. a, c, d
4. a - 2, 3
   b - 4
   c - 1
5. d

If all your answers are correct, go to Summary 2 on page 29. If you missed one or more questions, go through Programed Sequence 1 on the next page.

Programed Sequence 1

OVERVIEW: In this programed sequence we are going to discuss two of the most important aspects of adjustive behavior: attention and perception. In adjustive behavior, various stimuli are brought into the nervous system to be sorted out and evaluated before any response can take place. The kind of response which takes place, and the fact that any response at all occurs, is dependent upon these two important psychological processes.

---

1 There is always a vast number of perceivable stimuli present in the environment. However, from this vast number, our senses react to a far lesser number of stimuli, and we respond to even fewer still. The process by which we select, from all the stimuli we are capable of perceiving at a given time, only those stimuli which fit our immediate needs or interests is called attention.

Which of the following best defines attention?

a. The process by which our senses react to all the stimuli available at a given moment in the environment

b. The process by which we select, from all the stimuli perceivable at a given moment, only those stimuli which suit our immediate needs or interests

c. The process by which we select from those stimuli which suit our immediate needs and interests, only those stimuli which have meaning

2 Attention is, then, which of the following?

a. A process of selection

b. A process of interpretation

---

3 The first and limiting step in attention is sensory discrimination. This is the response of our sense organs, eyes, ears, nose, taste buds, etc., to some particular kind of physical energy in the environment. Examples of sensory discrimination are the eyes attending to the stimulus of light, or the ears, to a high pitched sound.

Which of the following is an example of sensory discrimination?

a. Our nose responds to the chemical energy of the smell of smoke.

b. Though there may be X-rays in the atmosphere, our eyes cannot detect them.

4 Our sense organs contain specialized cells capable of responding to certain environmental energy changes. These cells are called receptors. Our eyes contain receptors which are sensitive to electromagnetic energy in the form of light. Our taste buds contain receptors which are sensitive to the chemical energies of flavor, sweetness and sourness, etc.

Which of the following senses contains both receptors sensitive to thermal energy (heat and cold) and receptors sensitive to mechanical energy, e.g., motion, weight, and pressure?

a. The sight

b. The sense of smell

c. The sense of touch

---

5 Each receptor has a certain range of sensitivity.

Why do you suppose human receptors are unable to discern ultrasonic sounds?

a. Because they are within the range of human receptors

b. Because they are beyond the range of human receptors

6 All of our receptors or senses require some minimal level of energy before they are activated--or, to use more technical terms, some minimum absolute intensity of energy to which each will respond. This minimum level is called the absolute threshold. In each of the senses, this threshold varies with the individual. Thus, an individual with normal hearing has to suffer the noise of a fireworks display, whereas a person who is slightly deaf can simply turn off his hearing aid, and will not hear it at all. We sometimes fail to perceive stimuli even when they do fall within both the ranges and the intensities detectable by our receptors. This can happen when our receptors encounter a situation in which they cannot discriminate one stimulus from another, similar one. The degree of difference necessary for an individual to discriminate between two such stimuli is called the differential threshold.

Match each definition with the correct term.

a. The degree of difference necessary for one stimulus to be differentiated from another

b. The minimum absolute level of energy necessary to activate a receptor

1) Absolute threshold

2) Differential threshold

3) Activation threshold

7 Other external factors can have a significant effect on attention. Certain things attract our attention. These are: size, intensity, motion, repetition and contrast. The first attention-getter is size: the larger the billboard, the more likely we are to notice its message. A second factor is intensity: the louder the sound, the stronger the taste or odor, the more attention we pay to it. Moving and repetitive stimuli both attract the attention more than do stable stimuli. The fifth factor, contrast, is a marked difference in stimulation, such as sudden silence after continuous noise.

Which of the following are the five external factors which can affect attention?

a. Motivation
b. Size
c. Motion
d. Contrast
e. Intensity
f. Similarity
g. Repetition
h. Personal needs

---

8 Which of the following correctly describes the effect that the external factors of size, intensity, motion, repetition and contrast have upon our attention?

a. All of these factors tend to detract from attention
b. All of these factors tend to attract our attention

9 Internal factors can also affect our attention, such as individual's interests, motives, state of mind.

Match each lettered item with the terms which it describes.

a. Internal factor affecting attention

b. External factor affecting attention

1) Size

2) State of mind

3) Repetition

4) Intensity

5) Motives

6) Motion

7) Interests

8) Contrast

---

10 To sum up our discussion so far, it should be clear that at any one time, we are selectively aware of only a few of the available stimuli. This process of selection is called attention. It takes place in the mind and nervous system rather than in the receptors themselves.

Which of the following is true?

a. Attention is a process of selection which takes place in the receptors after stimuli have reached the mind and the nervous system.

b. Attention is a process of selection which takes place in the mind and the nervous system after stimuli have been detected by our receptors.

11 Perception goes beyond mere sensory reception. It is that process by which we discriminate among stimuli and attach meaning to them.

Which two of the following correctly differentiate between attention and perception?

a. Attention is that process by which we select stimuli from all those available, and perception is the process by which we discriminate among stimuli and attach meaning to them.

b. Attention is that process by which our receptors detect all the stimuli available at a given time, and perception is the process by which we select those which suit our immediate needs or interests.

c. Attention is selective, perception is interpretive.

12 In perceiving, i.e., attaching meaning to stimuli, the human organism follows certain patterns called organizational tendencies.

The first organizational tendency is called grouping. We tend to perceive collections of several stimuli as being grouped into patterns. We group stimuli on the basis of any one of three characteristics: proximity, similarity or continuation.

Which of the following best defines grouping?

a. Grouping is an organizational tendency by which we tend to group stimuli on the basis of meaning.

b. Grouping is an organizational tendency by which we tend to group stimuli on the basis of proximity, similarity, or continuation.

13 Look at part A of Figure 1 on page 6. We tend to view part A as three groups of X's, rather than as six X's. In this case, the factor that leads us to group the stimuli into pairs is proximity--the nearness of the components of the pairs.

Which best describes grouping on the basis of proximity?

a. We tend to perceive objects which are close together as belonging together--that is, to see them as groups.

b. We tend to perceive objects which appear to be closest to us as groups.

---

14 The second basis upon which we tend to group stimuli is similarity. This is illustrated in part B of Figure 1 on page 6. Looking closely, you can see that all the dots form a six-pointed star, or hexagon. However, at first most observers will not see a hexagon. Because the three white dots are dissimilar from the black dots we instead tend to see a triangle of black dots with the white dots forming their own triangle pattern overlapping it.

Which of the following best describes grouping on the basis of similarity?

a. We tend to perceive as groups objects which are close to each other.

b. We tend to perceive as groups objects which are like one another.

15 A third basis upon which we tend to group stimuli is shown in part C of Figure 1. We tend to see this set of dots as two separate continuous lines, one curved and one straight, even though they intersect and share a common dot at their intersection. Grouping on the basis of continuation is then, which of the following?

a. A tendency to perceive objects in sequence as belonging together

b. A tendency to view continuous stimuli as intersecting stimuli

---

16 Each of these factors, proximity, similarity and continuation, plays a part in the organizational tendency known as: (Choose one)

a. Attention

b. Pairing

c. Grouping

d. Absolute threshold

17 Now let's discuss a second organizational tendency--closure. This is illustrated in part A of Figure 2 on page 8. In all probability, what you "see" here are four squares. You may be aware that the squares have something missing from them, but the significant thing is that you still see them as squares, not simply as sets of unclosed line figures.

Which of the following best describes the organizational tendency of closure?

a. It is a tendency to perceive objects as closed groups.

b. It is a tendency to view stimuli as disjointed parts rather than as a whole object.

c. It is a tendency to fill in the gaps in multiple stimuli, to perceive them as whole objects rather than as disjointed parts.

18 We go now to a third organizational tendency--figure-ground perception. In most of our visual perceptions we tend to pick out a specific figure, and see it as against an extended, relatively formless background. In part B of Figure 2 you may have seen a white figure (vase) against a black ground. Or you may instead have seen two black figures (profiles) against a white ground. This is a classic example of what is known as a reversible figure-ground relationship, in that each of the elements may be perceived as either figure or ground.

If you hold your hand in front of your face while looking at the ceiling, you perceive your hand as a large object against a formless background of the ceiling. This is an example of which organizational tendency?

a. Figure perception

b. Configuration

c. Figure-ground perception

This is the end of Programed Sequence 1. Now take Summary Post-Quiz 1 on the next page.

Summary Post-Quiz 1

Answer the following questions as indicated in your Student Guide.

---

1. Match each set of sensory receptors to the types of energy to which it responds.

   a. Sight

   b. Smell and taste

   c. Touch

   1) Mechanical energy

   2) Chemical energy

   3) Electromagnetic energy

   4) Thermal energy

---

2. Which of the following is the best definition of attention?

   a. A tendency to group stimuli on the basis of proximity, similarity, or continuity

   b. A response by which an organism distinguishes or selects specific stimulus elements from all the stimuli presented to us by our environment at any given time

   c. The process by which our sensory receptors interpret stimuli available to us at any given time

---

3. Which of the following are external factors that tend to attract attention?

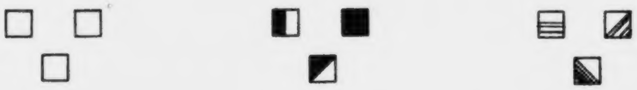
   a. Motivation

   b. Repetition

   c. Memory

   d. Size

   e. Contrast



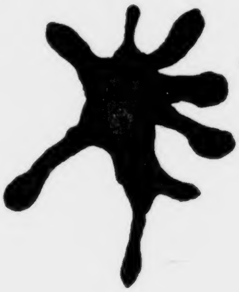
4. The above illustrates perceptual grouping based on:
   - a. Continuation
   - b. Frequency
   - c. Proximity
   - d. Figure-ground

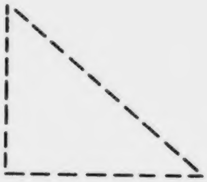
5. Each of the figures on the right illustrates one of the organizational tendencies in the left column. Match the illustration with the tendency.

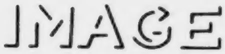
a. Figure-ground perception

b. Closure

c. Grouping

1)  = an amoeba

2)  = a triangle

3)  = the word "image"

4) X X X X X X = three groups of "X"'s

Now, check your answers on page 28.

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ANSWERS TO SUMMARY POST-QUIZ 1

1. a-3; b-2; c-1, 4
2. b
3. b, d, e
4. c
5. a-1; b-2, 3; c-4

Now, go to Summary 2 on the next page.

Summary 2

Let's consider now how principles of attention and perception apply to your leadership duties. Although you may not be aware of it, paying attention to, or attending to pertinent aspects of a given situation is a skill which can be learned. An officer must learn to attend to the pertinent aspects of a problem. Otherwise he runs the risk of misperceiving the problem and failing to find a solution. A leader who has the further responsibility for training men under his command must provide exercises to develop their skill in attending to relevant stimuli.

Discrimination Training

Training men to choose between relevant and irrelevant stimuli is known as discrimination training. Sky and surface lookouts are trained to make fine discriminations, as are sonarmen and radarmen. Basically discrimination training is accomplished by use of two methods: simultaneous presentation and successive presentation.

We shall use aircraft recognition training to exemplify the two methods. During training by simultaneous presentation a student might be shown a picture depicting a fighter, a bomber, a spotter and a helicopter. He must select the fighter from the group. Additional information concerning a specific type of fighter would then be provided--say, a fighter with a peculiarly shaped tail structure. Now the student is shown a picture of four fighter types with differing tail shapes and he must choose the one fighter specified. On each succeeding presentation the other aircraft in the picture become more and more similar to the specified aircraft. In short, training begins with a very easy discrimination and progresses to very difficult discriminations among very similar aircraft. In training by successive presentation, the student progresses from easy to difficult discriminations; however, only one stimulus (in this case, a picture of an aircraft) is shown at a time, and the student must decide whether or not that stimulus is the one that has been described for him.

In both successive and simultaneous discrimination training, the student progresses from relatively easy, gross discriminations to very fine and difficult discriminations. Discrimination training is just one of the ways in which individuals may be taught to attend to certain stimuli.

Sources of Misperceptions

In Summary 1 you learned that perception is interpretive. In other words, when we perceive a stimulus, we attach a meaning to it. Look at the lines in figure 3 on the next page.

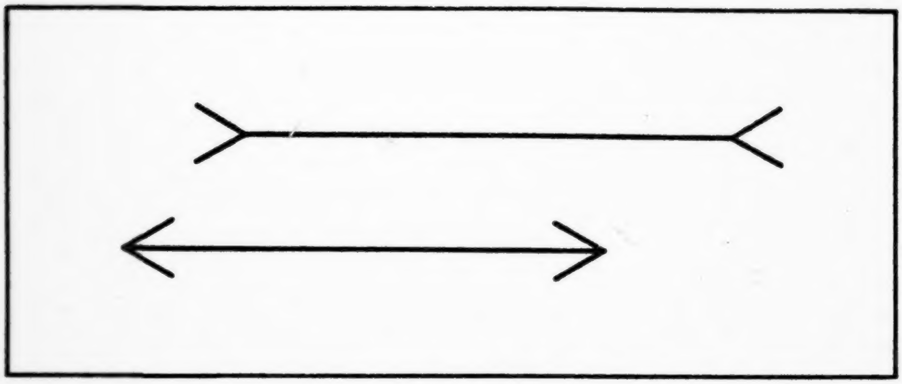

Figure 3

You probably found that the upper line looked longer. The fact is, however, they are actually the same length. The direction of the arrow-heads tends to optically shorten the lower line and elongate the upper one.

This figure illustrates an optical illusion. An illusion is simply a false perception, a misperception or distortion of what actually exists in the environment. We mention optical illusions here because they represent a simple, easy-to-understand example of how our perceptions can be affected by both external and internal factors.

Stimulus Generalization

A number of internal factors influence our interpretation of the objects and situations that we perceive. For instance, we tend to make what is called a stimulus generalization, based on past experiences. Stimulus generalization is the tendency to make a conditioned response to an unfamiliar stimulus which is similar to--but not the same as--the stimulus to which we have been conditioned. Suppose you are on the bridge of a ship at night and you see a pair of blue and orange running lights dead ahead. You would tend to equate blue with green and orange with red, and thus see blue as starboard and orange as port, making a stimulus generalization. As a result of the generalization, you would make the same response that you would make to standard running lights.

Familiarity

Besides stimulus generalization, a second factor influencing our interpretation of things we perceive is familiarity. Objects we see or handle frequently may actually be changing very gradually over a long period of time, and yet, we fail to note these subtle changes. Therefore, we perceive and respond as though no change had occurred. Consider the classic case of the young man who treats the girl next door as a pal, even after she has grown up to become an attractive young woman.

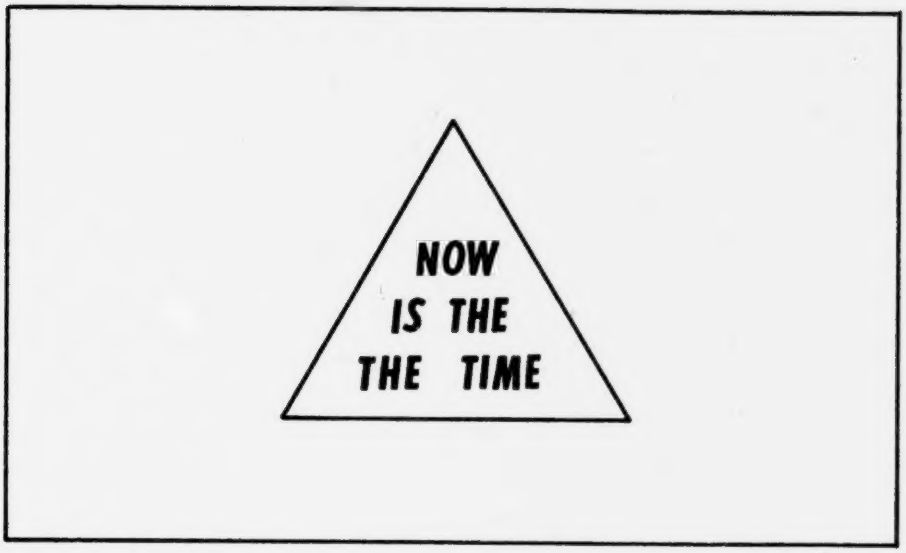

Figure 4

Set Responses

A third factor influencing perception is the so-called set response. What do the words in the triangle in figure 4 say? "Now is the time"? If you read them again, slowly and word by word, you will find that what they actually say is "Now is the the time." This misperception which you probably made is an example of set responding. The word "set" in this case is used in the sense of a readiness to respond in a certain way to a stimulus. We have all been conditioned over a period of years to read the English language in the context of meaningful words and sentences. We tend therefore to subconsciously correct minor deviations from this context, removing redundant elements and supplying missing ones. Set responding accounts for the difficulty a person has in discovering typographical errors in a printed text.

Set responding can have certain advantages, however. It provides us with patterns of action which can increase the efficiency of the problem-solving process. When we make a set response, we ignore various alternative possibilities for response, thus saving time and effort. Set responses have an obvious disadvantage. Although set responding can simplify problem-solving, it can also ensure, in some cases, that the problem will not be solved at all. In instances where new or different solutions are required, anything, such as a set, which limits the range of possible solutions can reduce efficiency. Creative people, research has shown, tend to have very weak sets in their approaches to problems.

Learned Attitudes

Stimulus generalization, familiarity, and "sets" influence the accuracy of our perceptions. There are, in addition, other, learned factors which can function in the same manner. One of these is attitude. As a future leader, it is important for you to be aware of attitudes in your men and to know when they are operating to cause misperceptions. Psychologists define attitude as a tendency to respond favorably or unfavorably to certain objects, persons or situations. Thus, attitudes make us tend to categorize objects or people. The attitudes of both the individual and society at large tend to be reinforced and strengthened--rather than changed--by perception. A person tends to selectively perceive those things which fit his attitudes and beliefs. He pays little attention to other factors. Things which might threaten his attitudes he either misperceives or simply doesn't perceive--distorts or ignores.

Religious, racial, or any other prejudice is an unfavorable or negative attitude toward a group which is then directed indiscriminately toward members of that group. Prejudice is one of the major attitudinal problems you will encounter as a leader.

Social pressure, cultural factors, and internal needs all affect the formation, or any change, of our attitudes. For example, a person whose attitude toward drinking is negative might be urged by social pressure to take a drink in order to be "one of the boys."

In order to maintain his identity with the group, he may bury his scruples and drink. Most instances of cultural influence on our perceptions go back to early childhood and are extremely subtle. For instance, a person's aversion to drinking may itself be the result of a cultural pressure exerted on him at an early age, e.g., in a nondrinking home or a strict school.

Attitude Learning as Differential Reinforcement

Attitude learning can be explained in a context with which you are already quite familiar--that of reinforcement. Through discrimination learning, a pigeon in a Skinner box can be conditioned to peck a white key in the presence of a red light, and a black key in the presence of a green light.

This is accomplished by providing reinforcement for the correct response in the presence of the appropriate stimulus. In a somewhat more complex and protracted way, the same kind of learning occurs in humans. Like any other learning, the learning of attitudes is controlled by reinforcement. When certain attitudes are reinforced and certain others are not, the process is known as differential reinforcement. The pigeon's responses to the colors are reinforced by portions of pigeon feed. Our own attitudes are reinforced by a great variety of stimuli such as propaganda, education, language or cultural or social suggestion. Families, schools and peer groups are all media which differentially reinforce the individual. Attitudes which these groups wish the individual to possess, are reinforced. Other non-reinforced attitudes tend to be eliminated, to drop by the wayside. In short, an individual's culture establishes the reinforcement contingencies and thus determines which attitudes will be fostered and which will not.

Attitude learning may also be explained in terms of modeling. A child imitates the behavior of his parents or of other adults. He imitates their attitudes as well. This imitative behavior is called modeling and it continues into adulthood. When a newly arrived plebe patterns his behavior after an upperclassman whom he admires, he is using the upperclassman as a model.

Having a model to imitate can ease a person's adjustment to a new and strange situation, but it can also be responsible for prejudice and misperceptions. A leader should develop a keen sensitivity to "models" his men may be following. Then he will be able to determine the causes of any misperceptions stemming from his subordinates modeling incorrect or undesirable behavior or attitudes. A leader himself should always remember his role as a model, and make sure that his behavior is exemplary.

This is the end of Summary 2. Now, take Summary Pre-Quiz 2 on the next page.

Summary Pre-Quiz 2

Answer the following questions as indicated in your Student Guide.

1. A plebe soon learns that certain upperclass midshipmen are more difficult to deal with than others. As a result he avoids these midshipmen while at the same time he seeks the company of more pleasant ones.

The situation illustrates behavior influenced by which of the following?

a. Prejudice

b. Modeling

c. Differential reinforcement

2. Which one of the following best summarizes the effect of modeling on our perceptions?

a. Modeling affects our perceptions only negatively, and it occurs whenever we imitate people who engage in socially disapproved behavior.

b. Modeling can influence our perceptions since we tend to adopt the attitudes and biases of our models.

c. Modeling has no influence on our perceptions since we only model those people who have attitudes with which we are in complete agreement.

3. The new division officer aboard a destroyer had been a petty officer for years. He had extensive experience ashore controlling the conduct of subordinates. He always found that the threat of punishment and loud reprimands keep the men pretty much in line. In his new position he has found that his assistant division officer often carries out orders with his own interpretations. Threat of punishment merely increases the communication gap between the two officers.

Which of the following best describes why the division officer misperceived the problem?

a. The division officer has been conditioned to expect well-trained, intelligent officers under his command. Stimulus generalization causes him to assume that this assistant division officer will also meet the standard.

b. The division officer is making a set response. He is treating the new problem in a manner consistent with ways he found effective in solving old problems without carefully evaluating the new situation. He doesn't realize that the old solutions might no longer apply.

c. The division officer is prejudiced. He feels he has been assigned an assistant who is obviously not officer material. There is no way for the division officer to act which would solve the problem.

4. A pigeon has been conditioned in a Skinner box to peck a yellow key, not the blue or the white one. The pigeon is then placed in another Skinner box containing an orange, a green, and grey key. He persists in pecking only the orange key.

The pigeon's behavior illustrate the effect of which factor on perception?

a. Familiarity
b. Stimulus generalization
c. Set response
d. Grouping

5. Which of the following correctly list external factors which may affect our perceptions?

a. Anxiety, personal bias, and sensory capability
b. Differential and absolute threshold of our receptors
c. Social pressures, cultural influences, and learned attitudes
d. Stimulus generalization, set response, and familiarity

Now, check your answers on page 42.

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ANSWERS TO SUMMARY PRE-QUIZ 2

1. c
2. b
3. b
4. b
5. c

If all your answers are correct, you have finished this segment. If you missed one or more questions, go to Programed Sequence 2 on the next page.

Programed Sequence 2

OVERVIEW: In this programed sequence we will consider how some of the principles of attention and perception can be applied to your leadership duties. We shall discuss how individuals can be taught to attend to the correct aspects of a problem using discrimination training. We shall also examine some of the common sources of misperceptions, and point out how a leader may guard against and deal with misperceptions among his men.

---

1 In order to solve a problem, it is necessary to attend to the correct elements or stimuli. When a leader is faced with the responsibility for training men under his command, he must provide exercises which train them to attend to the relevant factors of a situation. They must learn to sort out and remove the irrelevant stimulus elements even though these may appear at first to be the primary factors.

Which of the following is true?

a. Attention is an internal process and cannot be learned through training.

b. Attention is an internal process, which can be learned or at least improved through training.

√

2 Training men to choose between relevant and irrelevant stimuli is known as discrimination training--a technique commonly used to train a wide variety of skills. Sky and surface lookouts are trained to make fine discriminations, as are sonarmen and radarmen.

What technique is used to train men to discriminate between relevant and irrelevant stimuli?

a. Generalization training

b. Organizational training

c. Discrimination training

---

3 Let's use aircraft recognition training to illustrate the two kinds of discrimination training--simultaneous presentation and successive presentation. In simultaneous presentation a student might be shown a picture depicting a fighter, a bomber, a spotter and a helicopter. He must select the fighter from the group. Then he would be given additional information concerning a specific type of fighter, e.g., one with a peculiarly shaped tail structure. Then the student would be shown a picture of four fighter types with differing tail shapes and asked to choose the specified fighter.

The simultaneous presentation method of discrimination training calls for which of the following?

a. A very gross (obvious) discrimination followed by increasingly fine (difficult) discriminations

b. A very fine (difficult) discrimination followed by increasingly gross (obvious) discriminations

4 When conducting discrimination training by the simultaneous presentation method, which is true?

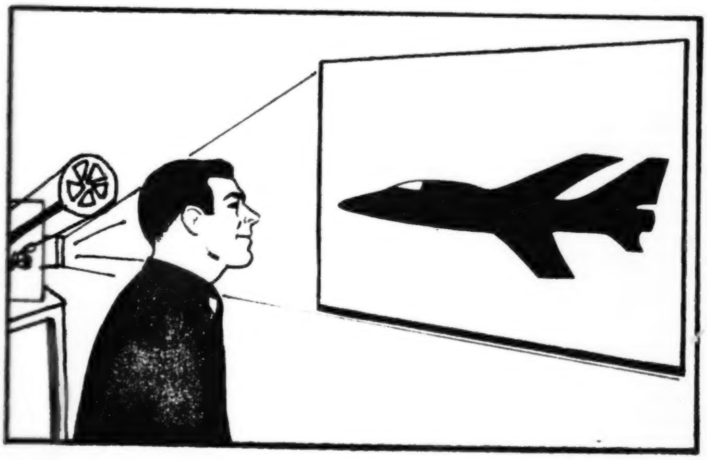
a. The trainee is shown one stimulus at a time and asked to say whether or not it is the specified stimulus.

b. The trainee is shown several stimuli at one time and asked to select the specified stimulus.

---

5 Simultaneous presentation discrimination training teaches an individual to attend to one specific stimulus feature in an array of stimuli. Discrimination training by means of successive presentation differs from this only in that the individual is shown only one stimulus at a time, not an array, and asked whether or not it contains the relevant feature. It too, progresses from very gross discriminations to very fine ones.

Which method of discrimination training is being used here?



a. Simultaneous presentation

b. Successive presentation

6 Match the type of discrimination training with the correct description. (Use all the numbered items.)

a. Simultaneous presentation

b. Successive presentation

1) Training in which the student is asked to select a stimulus from a group of stimuli on the basis of one feature

2) Training in which the student is asked to select a stimulus from a series of stimuli on the basis of one feature

3) Progresses from very gross discrimination to a very fine one.

---

7 In Summary 1 you learned that perception is interpretive, in other words, when we perceive a stimulus, we attach a meaning to it. You saw in the optical illusion, in Summary 1, too, that perception can be affected by external elements so that what is perceived is not really what is. Two lines may appear to be of different lengths, but be in fact, the same length. A number of external, and internal factors affect the way we perceive things, and often cause misperceptions, or false interpretations of reality. We shall now discuss some of the internal factors.

8 One internal factor influencing our perceptions is called stimulus generalization. This is the tendency to make a conditioned response to an unfamiliar stimulus which is similar to--but not the same as--the stimulus to which we have been conditioned. For example, if you have become conditioned by frequent visits from hard-sell salesmen to expect that any caller with a briefcase is a salesman, you might look out your window and generalize that the census-taker (who also carries a briefcase) is another salesman.

Which correctly defines stimulus generalization?

a. The tendency to make a conditioned response to a conditioned stimulus on the basis of one's past experience

b. The tendency to make a conditioned response on the basis of past experience to a stimulus which is similar to--but not the same as--the stimulus to which one has been conditioned

---

9 Suppose you were on the bridge of a ship at night and saw a pair of blue and orange running lights dead ahead. If you made a stimulus generalization, what would you think?

a. That the blue light, like a green one, indicates starboard and the orange light, like a red one, indicates port

b. That the blue and orange lights indicate something other than port and starboard

10 Besides stimulus generalization, another internal factor which influences our perceptions is familiarity. Objects which we see or handle frequently may actually be undergoing change, but since they are so familiar to us, we perceive and respond to them as if no change had occurred.

Which of the following is an example of misperception based on familiarity?

a. The young man who treats the girl next door like a pal even after she has grown up to become an attractive young woman

b. The midshipman who notices suddenly that many of his friends at home have little in common with him

---

11 A third internal factor which influences perception is "set." A set is a readiness to respond in a certain way to a stimulus. For example, we have all been conditioned to read English in terms of meaningful words and sentences. Therefore, if we are confronted with a piece of typewritten copy, we tend to subconsciously correct minor deviations from context such as spelling errors, missing words, etc.

When we look at Figure 4, on page 33, and read "Now is the time." we are exhibiting which kind of misperception?

a. Stimulus generalization

b. Familiarity

c. Set response

d. Discrimination training

12 Set responses have both advantages and disadvantages. A set sometimes provides us with an efficient approach to the problem-solving process, because we do not waste time trying various alternative responses, and thus save time. However, set responses have the disadvantage that they sometimes reduce efficiency, especially where a creative, original approach to problem solving is called for.

In line with the above, which is probably true of creative people?

a. They tend to have strong sets in their approach to problem solving.

b. They tend to have very weak sets in their approach to problem solving.

---

13 Stimulus generalization, familiarity, and set are all internal factors which influence the accuracy of our perceptions. In addition, learned factors, such as attitudes, also influence perception. An attitude is a tendency to respond favorably or unfavorably to certain persons, objects, or situations.

Which of the following best defines attitude?

a. An attitude is an internal, unlearned tendency to respond favorably to certain stimuli.

b. An attitude is a learned tendency to respond favorably or unfavorably to certain stimuli.

14 Attitudes cause us to categorize stimuli. The attitudes of both individuals and society at large tend to be reinforced and strengthened by perception. A person tends to selectively perceive those things which fit his attitudes, and pay little attention to or ignore those things which threaten or disagree with his attitudes.

Which of the following best explains the effect of perceptions on attitudes?

a. Perception tends to change or dispel attitudes, as an individual gradually perceives other factors which do not fit his attitudes.

b. Perception tends to strengthen or reinforce attitudes, as we tend to misperceive or ignore those things which do not fit our attitudes.

---

15 Religious, racial or any other kind of prejudice is an example of how perception acts to reinforce attitudes. Consider, for example, a person who is prejudiced against Puerto Ricans.

If he were to meet an individual whom he admired in every way, and then find out that this individual is a Puerto Rican, what would he be likely to say?

a. "He's certainly not a typical Puerto Rican, he's an exception rather than the rule."

b. "I've changed my mind about Puerto Ricans, they're not so bad after all."

16 Social pressure, cultural factors, and internal needs all affect the formation of, or any change in, our attitudes. For example, a midshipman might have a negative attitude towards drinking, yet be persuaded by social pressure (i.e., a need to be one of the boys) to change his attitude and take a drink. In order to maintain identity with the group, the midshipman may bury his scruples and drink. However, his negative attitude toward drinking might in itself be the result of a cultural influence...for example, he might have been brought up in a family or social milieu where drinking was forbidden.

What are some of the factors which act upon the formation of our attitudes?

a. Stimulus generalization
b. Social pressure
c. Cultural influences
d. Internal needs
e. Receptors

17 Just as the pigeon in the Skinner box was reinforced with pigeon feed when he made the correct or acceptable response, our attitudes are reinforced by such things as social acceptance, family approval, success in a career, etc. Non-reinforced attitudes, on the other hand, tend to drop out of a person's repertoire.

What, then, might be an efficient way to eliminate an undesirable attitude from a person's repertoire?

a. Withhold all reinforcement for it

b. Punish it

c. Allow it to drop naturally out of the person's repertoire

---

18 The preservation of attitudes by reinforcing only acceptable ones, is known as differential reinforcement.

Families, schools, and peer groups all differentially reinforce an individual's attitudes

This means that: (Choose one)

a. Attitudes which these groups wish the individual to possess will disappear.

b. Attitudes which these groups wish the individual to possess will be difficult to teach.

c. Attitudes which these groups wish the individual to possess will be reinforced.

19 Our perceptions may also be affected by the individuals whom we use as models. A model is someone whom we admire or respect, and therefore imitate. Young children use their parents as models, and adults often use an admired peer as a model. When we model our behavior after an individual, it is quite likely that we will imitate that individual's attitudes as well.

MIDN White admires a certain upperclassman who is an excellent scholar, but disdains sports. MIDN White begins to lose interest in his former passion, football.

In line with the above, what is the most likely explanation for MIDN White's behavior?

a. MIDN White is exhibiting an attitude toward football which he has had ever since childhood, because of a lack of role model.

b. MIDN White is using the upperclassman as a model, but imitating only his behavior, not his attitudes.

c. MIDN White is using the upperclassman as a model, and is imitating his attitudes as well as his behavior.

This is the end of Programed Sequence 2. Now take Summary Post-Quiz 2 on the next page.

Summary Post-Quiz 2

Answer the following questions as indicated in your Student Guide.

---

1. Which one of the following best summarizes the effect of modeling on our perceptions?

   a. Modeling has no influence on our perceptions since we only model those people who have attitudes with which we are in complete agreement.

   b. Modeling affects our perceptions only negatively, and it occurs whenever we imitate people who engage in socially disapproved behavior.

   c. Modeling can influence our perceptions since we tend to adopt the attitudes and biases of our models.

---

2. A plebe soon learns that certain upperclass midshipmen are more difficult to deal with than others. As a result he avoids these midshipmen while at the same time he seeks the company of more pleasant ones.

   The situation illustrates behavior influenced by which of the following?

   a. Prejudice

   b. Modeling

   c. Differential reinforcement

3. The new division officer aboard a destroyer had been a petty officer. He had extensive experience ashore controlling the conduct of subordinates. He always found that the threat of punishment and loud reprimands kept the men pretty much in line. In his new position he has found that his assistant division officer often carries out orders with his own interpretations. Threat of punishment merely increases the communication gap between the two officers.

Which of the following best describes why the division officer misperceived the problem?

a. The division officer is making a set response. He is treating the new problem in a manner consistent with ways he found effective in solving old problems without carefully evaluating the new situation. He doesn't realize that the old solutions might no longer apply.

b. The division officer has been conditioned to expect well-trained, intelligent officers under his command. Stimulus generalization causes him to assume that this assistant division officer will also meet the standard.

c. The division officer is prejudiced. He feels he has been assigned an assistant who is obviously not officer material. There is no way for the division officer to act which would solve the problem.

4. A pigeon has been conditioned in a Skinner box to peck a yellow key, not the blue or the white one. The pigeon is then placed in another Skinner box containing an orange, a green, and grey key. He persists in pecking only the orange key.

The pigeon's behavior illustrate the effect of which factor on perception?

a. Grouping

b. Familiarity

c. Set response

d. Stimulus generalization

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5. Which of the following correctly lists external factors which may affect our perceptions?

a. Stimulus generalization, set response, and familiarity

b. Social pressures, cultural influences, and learned attitudes

c. Differential and absolute threshold of our receptors

d. Anxiety, personal bias, and sensory capability

Now, check your answers on page 58.

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ANSWERS TO SUMMARY POST-QUIZ 2

1. c
2. c
3. a
4. d
5. b

This is the end of Part Two, Segment V.

United States Naval Academy

INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PART TWO

INDIVIDUAL BEHAVIOR

Segment V

Attention and Perception

Progress Check

WESTINGHOUSE LEARNING CORPORATION
Annapolis, Maryland
1971

ATTENTION AND PERCEPTION

PROGRESS CHECK

Question 1.

SMSN Hughes was a signalman on the USS Canberra. During a training exercise, Hughes was directed to contact the USS Boston. Several smaller escort vessels were in the area during the maneuvers and, unable to distinguish one type of vessel from another, Hughes tried to contact one of the escort vessels by mistake.

Select the appropriate type of remedial training SMSN Hughes evidently needs in the situation above.

a. Stimulus generalization training

b. Signalman training

c. Discrimination training

d. All of the above

Question 2.

Select the correct definition of attention.

a. Any observing perception or orientational response in which the individual distinguishes a variety of stimuli within his absolute and differential thresholds

b. Any response which the individual has permanently resolved to keep foremost in his conscious thought patterns

c. Any perception or response which the individual compulsively interprets on the basis of his sensory perception

d. Any response in which the individual selects or distinguishes a specific stimulus from the general stimulus complex presented by our environment at any given time

Question 3.

If one extends his hand above his head and looks at it with the fingers spread out and against the background of the ceiling, one could describe this perception as which of the following relationships?

a. Figure-ground

b. Grouping

c. Closure

d. Contour

Question 4.

Select the phrase which identifies the cause of the misperception in the following example.

Marine LT Jacobs had recently completed a 13-month tour in Vietnam. During this time, his unit was subjected to repeated mortar attacks. LT Jacobs' first reaction was to throw himself to the ground.

While walking behind the end zone at the Army-Navy game, Navy scored a touchdown. As usual, a cannon was discharged immediately thereafter. LT Jacobs threw himself to the ground.

a. Stimulus immobilization

b. Recognition confusion

c. Stimulus generalization

d. Stimulus disassociation

Question 5.

SM3 Howard was asked to study the basic silhouette of a particular type of enemy destroyer and was given a verbal description of its distinguishing features. After a few moments study he was shown several photos of destroyers, one at a time, and asked to identify the original destroyer when it appeared.

Which method of discrimination training is described above?

a. Successive presentation

b. Random presentation

c. Simultaneous presentation

d. Group presentation

Question 6.

LT Rosenberg informed ENS Barett that secret orders had just been received for the ship's immediate departure for the South China Sea, and ordered him to load ship's supplies as quickly as possible. ENS Barett began the loading task but did not encourage speedy completion since he did not want to have to explain "why" to the crew. Further, ENS Barett had been fooled once before by LT Rosenberg, who had used the "secret departure orders" ploy to urge completion of a loading task earlier than necessary.

The ship did have secret departure orders and confusion reigned during the final hours to complete the loading of stores.

ENS Barett obviously misperceived the situation and failed to respond properly. Select the reason for his misperception.

a. Denial of source credibility

b. Attitude preservation by selective interpretation

c. Desire to reduce anxiety

d. Reinforced prejudice

Question 7.

From the following examples of misperception, select the identifying phrases which correspond to the order of the examples.

1) LT Ignatus believed that the southerners in his unit would not perform to the best of their ability because all his CPOs were New Yorkers.

2) ENS Woodruff thought that card playing was morally degrading to the young sailors in his unit yet he approved of his wife playing bridge once a week.

3) LTJG Braen told his men that nothing was more important than achieving better results on their monthly inspection. He had told them that each month; yet, when the unit continually failed to achieve better results, he failed to take corrective action.

a. 1) Identity with the group; 2) stereotyping and prejudice; 3) denial of source credibility

b. 1) Selective interpretation; 2) stereotyping and prejudice; 3) identity with the group

c. 1) Stereotyping and prejudice; 2) selective interpretation; 3) denial of source credibility

d. 1) Stereotyping and prejudice; 2) denial of source credibility; 3) selective interpretation

Question 8.

Select the paragraph which describes the nature of social pressures.

a. Social pressures develop from society's ability to adopt necessary changes by evolution. Anyone who advocates more rapid change is generally ignored by the rest of society.

b. Social pressures result from the individual's inability to create original thoughts or values. Society prevents individual deviations from established norms.

c. Social pressure is the differential reinforcement by families, schools, peer groups and others, which prompts individuals to respond in a certain way. Socially approved role models assist in defining acceptable behavior.

d. Social pressures develop from the consensus of the elite that all established norms should be rigorously adhered to by its members. Deviation is usually easily recognized; thus forces are quickly mobilized against it.

Question 9.

BM3 Solowolski was the only member of his cultural background in his boat crew. BMSN Nevitts openly expressed his resentment of Solowolski and frequently made bigoted remarks about him to the other members of the boat crew in Solowolski's absence. When Solowolski gave Nevitts an order with the rest of the crew, Nevitts was visibly very bored and complained a great deal. Often, Nevitts tried to convince the rest of the crew that he was being singled out by Solowolski for extra duty.

From the following choices, select the apparent cause for BMSN Nevitts' perception of his relationship with BM3 Solowolski.

a. Denial of source credibility
b. Anxiety reaction
c. Maintenance of group identity
d. Stereotyping and prejudice

Two/V/RPF INTRODUCTION TO PSYCHOLOGY AND LEADERSHIP

PROGRESS CHECK ANSWER AND REMEDIATION FORM

PART Two SEGMENT V

REMEDIATION TEXT Syndactic Text VOL-II-B

ITEM	ANSWER	REMEDIATION REFERENCE
1	c	Summary 1: Pages 1-4 Summary 2: Pages 29-30
2	d	Summary 1: Pages 1-2
3	a	Summary 1: Pages 4-7
4	c	Summary 2: Pages 31-32
5	a	Summary 2: Pages 29-30
6	a	Summary 2: Pages 34-35
7	c	Summary 2: Pages 34-37
8	c	Summary 2: Pages 34-37
9	d	Summary 2: Pages 34-37
10	☐	
11	☐	
12	☐	
13	☐	
14	☐	
15	☐	

PROGRAM FRAME ANSWERS

PART TWO

Segments I, II, III, IV & V

PROGRAM FRAME ANSWERS

PART Two SEGMENT 1 TYPE Syndactic Text PAGE 1 OF 1 PAGES

FRAME OR QUESTION NUMBER	CORRECT ANSWER
PROGRAMED SEQUENCE 1	
1	c
2	a
3	d
4	b
5	b
6	c
7	a
8	d
9	c
10	a
11	a
12	b
13	b
14	a
15	b
16	a
17	a-2,b-3, c-4
PROGRAMED SEQUENCE 2	
1	b
2	b
3	b
4	b
5	a
6	b
7	a
8	c
PROGRAMED SEQUENCE 3	
1	c
2	b
3	c
4	a
5	b
6	c
7	a-2,b-1, c-4,d-4, e-2
PROGRAMED SEQUENCE 4	
1	a
2	b
3	c
4	c
5	b
6	a
7	c
8	a
9	a
10	c
11	b
12	a

PROGRAM FRAME ANSWERS

PART Two SEGMENT II TYPE Syntactic Text PAGE 1 OF 1 PAGES

FRAME OR QUESTION NUMBER	CORRECT ANSWER
PROGRAMED SEQUENCE 1	
1	a,b,c
2	b
3	b
4	b,c
5	d
6	a-1,3,4 b-2,5
7	a-1,2,4 b-3,5
8	a
9	b
10	a
11	b
12	b
13	a
14	b
15	b
16	a-3,b-2 c-1
17	b
18	b
19	c
20	a
PROGRAMED SEQUENCE 2	
1	a
2	a-1,b-3
3	c
4	b
5	a-2,b-1 c-3
6	d
7	c
8	NO RESPONSE
9	c
10	b
11	b
12	a-3,b-2 c-1
13	d
14	a
15	a
16	b
17	b
18	a
PROGRAMED SEQUENCE 3	
1	a-2,b-3 c-1,d-4
2	d
3	c
4	a
5	b
6	c
7	NO RESPONSE
8	a
9	a
10	b

PROGRAM FRAME ANSWERS

PART Two SEGMENT III TYPE Syndactic Text PAGE 1 OF 1 PAGES

FRAME OR QUESTION NUMBER	CORRECT ANSWER
PROGRAMED SEQUENCE 1	
1	c
2	b
3	a
4	d
5	a-2,b-1 c-3
6	a
7	b
8	a
9	b
10	a-2,b-3
11	No Response
12	b
13	a
14	b
15	a-2,b-3
16	b
17	b
18	b
19	a,b
20	c
21	b
22	c
23	b
24	c
25	b
PROGRAMED SEQUENCE 2	
1	b
2	b
3	1-c,2-b
4	a
5	a
6	b
7	c
8	a
9	b
10	c
11	c
12	a
13	b,c
14	a-2,b-1
15	a
16	b

PROGRAM FRAME ANSWERS

PART Two SEGMENT IV TYPE Syndactic Text PAGE 1 OF 1 PAGES

FRAME OR QUESTION NUMBER	CORRECT ANSWER
PROGRAMED SEQUENCE 1	
1	c
2	a
3	b
4	a
5	c
6	b
7	c
8	c
9	a
10	b
11	a
12	b
13	NO RESPONSE
14	a
15	d
PROGRAMED SEQUENCE 2	
1	c
2	b
3	a
4	c
5	b
6	b
7	b
8	b
9	a
10	b
11	a
12	a
13	b
14	a-2,b-1, d-3
15	a,c
16	a
17	b

PROGRAM FRAME ANSWERS

PART Two SEGMENT V TYPE Syndactic Text PAGE 1 OF 1 PAGES

FRAME OR QUESTION NUMBER	CORRECT ANSWER
PROGRAMED SEQUENCE 1	
1	b
2	a
3	a
4	c
5	b
6	a-2,b-1
7	b, c, d, e, g
8	b
9	a-2,5,7 b-1,3,4,6,8
10	b
11	a,c
12	b
13	a
14	b
15	a
16	c
17	c
18	c

FRAME OR QUESTION NUMBER	CORRECT ANSWER
PROGRAMED SEQUENCE 2	
1	b
2	c
3	a
4	b
5	b
6	a-1,3 b-2,3
7	No Response
8	b
9	a
10	a
11	c
12	b
13	b
14	b
15	a
16	b,c,d
17	a
18	c
19	c